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Original Communications.

PROPHYLACTIC HYGIENE.

LECTURE VI.—ON DISINFECTION.*

BY PROFESSOR DUJARDIN-BEAUMETZ, PARIS, FRANCE.†

GENTLEMEN:—In the previous lecture we had under consideration the subject of disinfectants. I shall tell you to-day how to utilize them; in other words, I shall speak of disinfection.

From the point of view which we occupy—*i.e.*, that of prophylactic hygiene—we shall have to study successively the disinfection of contaminated places, the disinfection of garments and bedding, then that of persons who have been in contact with the sick, and, lastly, the disinfection of the dejections. Let us begin with the disinfection of contaminated places.

Here we cannot avail ourselves of heat, the most powerful of disinfectants, unless we burn our houses down, which in times of epidemics has been done in some countries where dwellings are of little value. Hence we are obliged to have recourse to either gaseous or liquid disinfectants. The first are chiefly employed in France under the form of sulphurous fumigations; the second are in

* Advance sheets of a lecture delivered in Cochin Hospital, and translated for this journal by E. P. Hurd, M.D.

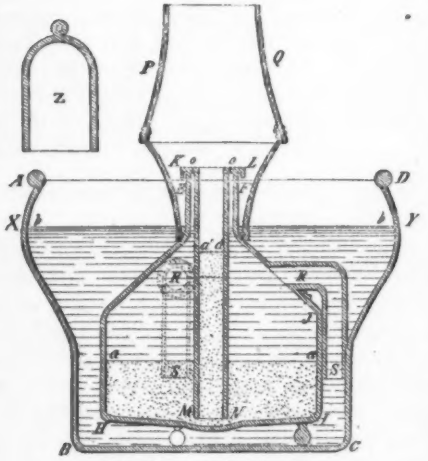
† Member of the Academy of Medicine, Physician to Cochin Hospital, etc, Paris, France.

usage in Germany, Austria, and Russia under the form of sublimate washings. Let us examine both methods.

As for the sulphur fumigations, you may, as I have shown in my communication to the Academy of Medicine,* employ three sources of supply of sulphurous acid,—sulphurous anhydride, sulphide of carbon, and burning sulphur. You are aware that Pictet, of Geneva, who is so good an authority on frigorific apparatuses, has utilized sulphurous acid rendered liquid by pressure. This substance, which has been described under the name *sulphurous anhydride*, is contained in charged bottles similar to the Seltzer-water siphon-bottles, and all you have to do is to press down the piston to give issue to a stream of liquid sulphurous acid, which boils at the ordinary temperature, undergoing transformation into the gaseous state. This is a handy way of obtaining sulphurous vapors, and if it has not been more employed in disinfection, it is because the siphon bottles of sulphurous anhydride are relatively costly.

When sulphide of carbon is burned, sulphurous acid and carbonic acid are set free. Ckiandi-Bey, one of the engineers who is particularly interested in all questions relating to sulphide of carbon, has constructed a very ingenious lamp, which I here place before you (Fig. 1), and which enables us to burn sulphide of carbon without any danger. In fact, in this burner, the water contained in a copper receptacle, A, B, C, D, enclosing the lamp, I, H, E, F, penetrates by three siphons, R, S, in the interior of the latter, and comes in contact with the upper part of the sulphide of carbon, which it replaces as fast as it is burned. When all the sulphide of carbon has been consumed, the water penetrates the wick in its turn, and the lamp is extinguished. These lamps have been chiefly utilized by the marine department, which has derived advantage from them in the sulphurization of sailing-vessels; and, setting aside the first cost of the lamp, the expense of disinfection by sulphide of carbon is relatively trifling, and does not exceed twenty-five cents for a room of one hundred cubic metres.

FIG. 1.



Sulphide of carbon burner.

You may also employ sulphuretted hydrogen, which by its combustion furnishes sulphurous acid and water, and in the experiments which I have made with Dariex in treating pulmonary tuberculosis by inhalations and hypodermic injections of sulphurous acid, we employed a sulphuretted hydrogen burner devised by Chantrelle; but the liberation of sulphuretted hydrogen diffuses a disagreeable odor, and, this gas being toxic, this method cannot be made applicable to disinfection. It remains for us now to consider disinfection by sulphur fumigations.

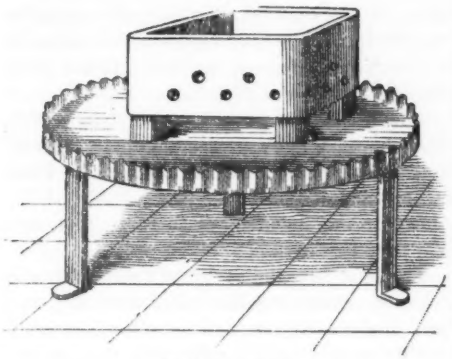
You must, first of all, remember that fifteen grammes of sulphur in burning evolve ten litres of sulphurous acid. We make use, in most cases, of the flowers of sulphur, and, as the quantity to burn varies between thirty and forty grammes per cubic metre, it is essential that you should know how to burn this sulphur to the best advantage. When the apartment is gauged into cubic metres, you divide the quantity of sulphur necessary for the disinfection into several lots, so as not to exceed one kilogramme of sulphur per lot. To burn this sulphur, you can make use of a fire-proof clay box pierced with holes like the one which I here show you (Fig. 2), and which rests on a plate of sheet-iron, or you can extemporize with bricks and sand a suitable trough for the purpose. Lastly, to kindle your sulphur over its entire surface, you can do as Pasteur advised us to do when we made our experiments, pour a little alcohol over the sulphur before setting it on fire.

To-day we can make use of a still simpler method,—*i.e.*, employ the sulphur "bougies" devised by my pupil Deschiens. For the disinfection of apartments, he has constructed a huge lamp, consisting of a tin box full of melted sulphur; a large wick occupies the centre of this box and enables one easily to

* Dujardin-Beaumetz, "Experiments on the Disinfection of Places which have been occupied by Persons Sick with Contagious Affections" (*Bull. Gén. de Thér.*, t. cvii. p. 241).

light the lamp (Fig. 3). As I have already told you, the disinfectant value of sulphur is largely proportional to the closeness of the room undergoing disinfection, and it is necessary not only to shut the windows and doors, but to stop all the chinks and crevices. Yet,

FIG. 2.

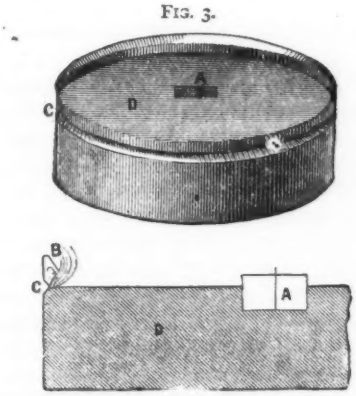


Sulphur burner.

despite all your care, you will never prevent this gas from escaping, by reason of its extreme diffusibility. It is, then, only by pasting paper around the windows, by stopping up the chimneys, and making tight the doors that you can get good results from these sulphurizations of contaminated places.

The sulphur fumigations have this advantage, that you can leave in the apartment all furniture, and in particular the bedding, sulphurous acid having a considerable force of

FIG. 3.



Sulphur bougie burner.

penetration, and permeating even the interior of mattresses. In our experiments, and in those made by Dr. Aubert, it was demonstrated that there is scarcely any alteration of the textile fabrics: only the metallic objects may become tarnished; this may, however, be prevented by covering them with a layer of vaseline.

To render the disinfection more active, Vallin has proposed to charge the air of the room with moisture by sprinkling the floor of the apartment with water, or by passing a wet sponge over the walls, or by boiling water in the room. I believe this an excellent procedure from a disinfectant point of view; unfortunately, it has the disadvantage of discoloring the objects in the room, for not only does the sulphurous acid dissolve in the water, but some sulphuric acid is also generated.

As for the quantity of sulphur to burn, this varies with the tightness of the room to be disinfected. When there are not too many ventilating chinks, and such as exist can be easily stopped, the quantity of forty or fifty grammes per cubic metre should suffice. When, however, it is difficult to make the room tight, you must double this quantity, and even in this case you are not sure of having thorough disinfection. After the sulphur has been set on fire, you quit the room, and for twenty-four hours, at least, you leave it shut up, after which you proceed to a careful washing and scrubbing of the apartment.

In concluding what I have to say under this head, I am going to read to you the order of service which M. Bezanson, ward superintendent to the prefecture of police, and myself had printed for the benefit of the squads of disinfectors employed for the city of Paris; these rules will sum up in definite shape the main points which I have just furnished you.

ORDER OF SERVICE FOR THE CORPS OF DISINFECTORS.

The service of disinfection at the patient's house, after his transportation to the hospital or after his decease, shall commence at seven o'clock in the morning, and cease at 7 P.M.

The chief of the station shall see that all the men are present at the regular hour. He shall report to the prefect those who are tardy, and, in a general manner, those who do not conform to the instructions and orders given. He shall take care that the utensils and implements put at the disposal of the squads shall be employed regularly, and he shall keep a strict account of all that come in and all that go out.

The chief of the station shall take pains to see that the wagon before starting out is provided with the following objects and disinfectant materials:

1. A plate of sheet-iron sixty centimetres by sixty;

2. A bag of sand;

3. Sulphur in packages of five hundred grammes;

4. Methyl alcohol (wood spirit) in bottles of two hundred grammes;

5. Fire-pots of earth or of brick;

6. A quantity of matches;

7. A quantity of shavings;

8. A metre measure;

9. A short ladder (about two metres);

10. A pot of glue and a brush;

11. A lot of paper for pasting over walls, etc. (old newspapers, for instance);

12. Some bottles of chloride of zinc.

When the signal for departure is given, the superintendent will place in the hands of every man belonging to the corps a card on which is written his name, the hour of departure, and the number and street of the tenement to be disinfected.

The wagon will set out immediately, and reach this place by the most direct route.

On arriving at the place of destination, the squad will present to the master of the premises their cards of service, and will repair to the room to be disinfected: it is always proper to ask some member of the family to assist in the work of disinfection. They will then proceed to their work according to the following instructions:

Take the dimensions of the room, measure the length, breadth, and height, multiply the first by the second and the product by the third. This measurement is taken in order to determine what quantity of sulphur should be burned in the apartment. This should equal twenty grammes (three hundred grains) per cubic metre (1.3 yard); thus, a room of twenty-five cubic metres will require a package of five hundred grammes.

Place on the floor or on tables all the objects which have been in contact with the cholera patient. Stop up the chimney, and close the windows and doors, pasting paper over all crevices.

Arrange on the plate of sheet-iron placed in the middle of the room the fire-pot or the bricks, taking all possible precautions against setting the building on fire; all papers and textile fabrics should be removed. In default of a suitable fire-pot, form, by means of bricks and sand, a sort of shallow basin of about thirty centimetres by thirty, into which the necessary quantity of sulphur shall be poured; moisten the surface of the sulphur with a little alcohol; throw over it a few shavings, and set it on fire. Do the same with the fire-pot if you have one.

Close the door of the apartment. Make tight the outside door; give the key to the keeper, with orders to allow no one to enter.

Before leaving the house do not fail to throw into the sinks and privies a solution of chloride of zinc, five hundred grammes (sixteen ounces) to ten litres of water (ten quarts). The operation having been finished, the disinfectors will see that a note is made on their card of service by the keeper of the house or one of the members of the family of the hour of their arrival and departure.

The corps of disinfectors will then return by the most direct route to the central station. The superintendent of the station will write on the card of service the precise hour of the return of the disinfectors to their post, and will keep this card.

The next day, the squad will return to the premises which they had disinfected the day before, open the doors and windows, throw a fresh quantity of chloride of zinc solution (5 per 100) into the sinks and privy-vaults, and bring back their utensils to the station. The men are absolutely forbidden to quit their post under any pretext whatever without permission of the superintendent of the station.

The disinfectors and the drivers are forewarned that any irregularity or negligence in the execution of their service will be severely punished. The employé who does his work badly, or who becomes intoxicated, may be deprived of his wages, or even immediately dismissed from service.

This is the way disinfection is practised in Paris.

In Germany, in Austria, and in Russia the sulphurous fumigations have been completely abandoned, and the authorities depend on corrosive sublimate for the disinfection of contaminated places. We will, if you please, take as an example of this second mode of disinfection the method which now prevails in the city of Berlin, where they have established for the first time a public disinfecting station, and we will follow the very faithful description which has been given of it by Dr. A. J. Martin.*

I will omit for the present all that pertains to the central disinfecting station, where are brought the bedding, tapestry, and clothing for disinfection. I shall return to this subject presently. I am now concerned only with the

* A. J. Martin, "Le premier établissement public de désinfection de la ville de Berlin" (*Revue de Hygiène et de Police Sanitaire*, 1888).

disinfection of houses, and we shall be able to contrast the order of service which I have just read you with that which is put in practice by the disinfectors of Berlin.

The first parts of these two orders are similar; that is to say, the men who go in the covered wagons receive a card of service numbered, the exact hour of departure and the route to be taken being marked down. The disinfectors take with them the following objects:

1. A mask or face-protector lined with antiseptic wadding;

2. A wire basket with three compartments holding a large bottle and a spray apparatus: the bottle contains a disinfectant liquid;

3. A case containing implements and brushes;

4. Linen sacks of different forms to hold objects to be removed from the building: these bags have each a number worked into them with red cotton.

The disinfector, for one man here does the work, makes bundles of all the objects found in the room. He burns things of little or no value; then he scrubs the floors, walls, furniture, windows, and doors with brushes and sponges soaked in a 1 per 1000 solution of sublimate. As for the metallic objects, he rubs them over with vaseline, and subjects them to fumigation with chlorine. The objects placed in bags are put into the covered wagon and carried to the disinfecting station, where they are subjected to the action of high heat.

The disinfectors are obliged to take the utmost pains in personal cleanliness. When the disinfector enters the apartment where he is to operate he puts on a long linen cloak, which, after he gets through with his work, is brushed and cleansed with a carbolic solution; this cloak is worn only in the contaminated dwelling, and before leaving the latter the disinfector makes a special bundle of it. Just before making up into packages the objects which are to be conveyed to the hot-steam room, the operator places over his face the mask lined with wadding; this is removed and burned after the completion of the disinfection. Lastly, every evening, at the end of the day's work, which lasts from seven in the morning to seven at night, the disinfector takes a bath, and washes with great care his hair and his beard.

As you see, disinfection in Berlin consists of two parts,—first disinfection of the room, then of the clothing, carpets, and bedding, and all textile fabrics that have been in contact with the patient.

As far as disinfection of rooms is concerned, it may be demanded if the thorough washing with a sublimate solution (1 per 1000) of the walls of the apartment is really practicable, since the wall-papers are sure to be injured thereby? Certainly, if the process seems applicable enough when you have painted surfaces to deal with, it is objectionable in the case of papered walls, unless you remove and destroy the paper.

In the hospitals of St. Petersburg, which I have just visited, I have seen put in practice these processes of disinfection, as in the Alexander hospital-barrack, one of the models of the kind, which we would do well to copy after in any similar establishment which we may hereafter construct. In this hospital there is a physician who has the charge and sole responsibility of the service of disinfection, which pertains at once to the clothing, the bedding, and the wards. As for the latter, the solution of sublimate above mentioned (1 per 1000) is used, and by means of a hand-pump similar to those used in our gardens the walls and ceiling of the apartments are covered with the solution. But, I repeat, the walls are painted, and their surface is perfectly smooth, while, on the contrary, in our apartments, and especially in the rooms occupied by the poor population, it is not so; and I do not see how you are going to have thorough disinfection of these rooms without sacrificing the wall-papers.

However, we are intending to make trials here in Paris of this mode of disinfection, and we shall then be able to judge for ourselves which are best, the gaseous fumigations or the sublimate washings.

Therefore, to sum up,—in the present state of our knowledge, I would say, whenever the circumstances permit have recourse to sublimate solutions, and make your cleansing as thorough as possible. Whenever, on the contrary, your washings with sublimate cannot be thoroughly done, make use of the sulphurous fumigations, taking care to have the room as tightly closed as possible.

Thus far we have been concerned only with the disinfection of contaminated houses when these places have been evacuated; can this disinfection be carried out when these habitations are occupied by the patients? It must be admitted that under such circumstances disinfection becomes difficult and is likely to be disappointing. At the same time, in cases where you have to do with diseases

which are eminently contagious, like smallpox and diphtheria, it has been recommended, in order to prevent the transmission of contagion from the patient to visitors and attendants, that the room should be sprinkled with disinfectant substances, or that these should be kept in open vessels by the bedside of the patient. These are methods to be utterly abandoned, for they are of no worth; they impregnate the air of the room with odors injurious rather than beneficial. What is worth far more, while being yet of doubtful utility as far as the end in view is concerned, is spraying with antiseptic liquids, such as solutions of carbolic acid, thymic acid, or of antiseptic mixtures, one of the most active of which is Penne's Antiseptic Vinegar, of which the following is the formula:

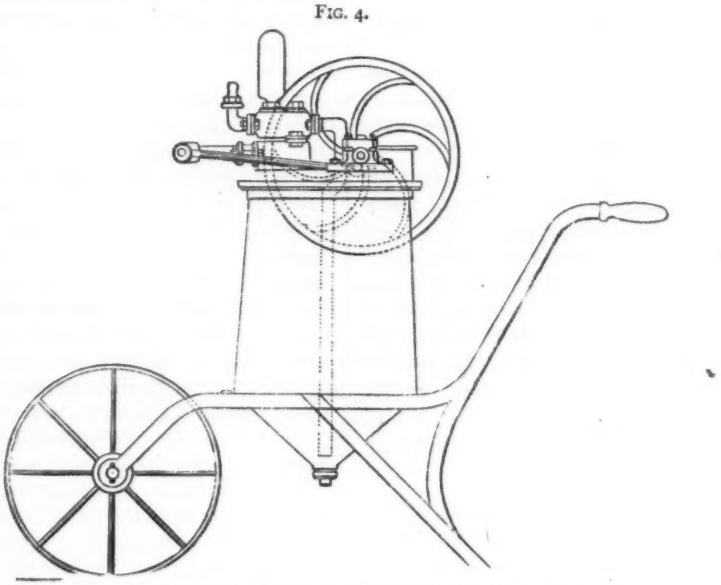
Salicylic acid, 30 parts;
Acetate of aluminium, 30;
Alcoholate of eucalyptus globulus, 600;
Alcoholate of verbena, 100;
Alcoholate of lavender, 100;
Alcoholate of benzoin, 100;
Acetic acid, 100. M.

To make these pulverizations we use the large spray atomizers employed in surgery.

As for garments and objects of bedding, all are agreed in acknowledging the superiority of heat, and if there is still any disputation, it is not with regard to the principle itself, but the apparatus to be employed in order to obtain from the heat its maximum of disinfectant power; and this brings us to the subject of disinfecton-stoves.

Many models have been proposed, but if you recall to mind what I said in the last lecture, you will understand that the only kinds which should be employed are the stoves for steam under pressure, and that henceforth we ought utterly to discard the hot-air stoves, as well as those for overheated steam, and, in general, stoves for hot air and steam without pressure. The type of these stoves for steam under pressure has been furnished by Geneste and Herscher. These are the stoves which are now placed in our hospitals, and you can see the working of one of them in this hospital (Cochin). The figure which I now show you (Fig. 5) sufficiently indicates the principle on which these stoves are constructed. This stove consists of a metallic cylinder, 1.30 metres in diameter, into the interior of which a car is rolled over an iron track, on which car are placed the objects to be disinfected. This cylinder is closed and made air-tight by means of two doors, one at each end. By the side of this apparatus there is a boiler that furnishes the steam, which penetrates the stove by tubes, some of which are tight, enabling the operator to raise the temperature of the stove and keep it at 130° C.; the others are pierced with holes forty millimetres in diameter, which let the steam escape at a given moment.

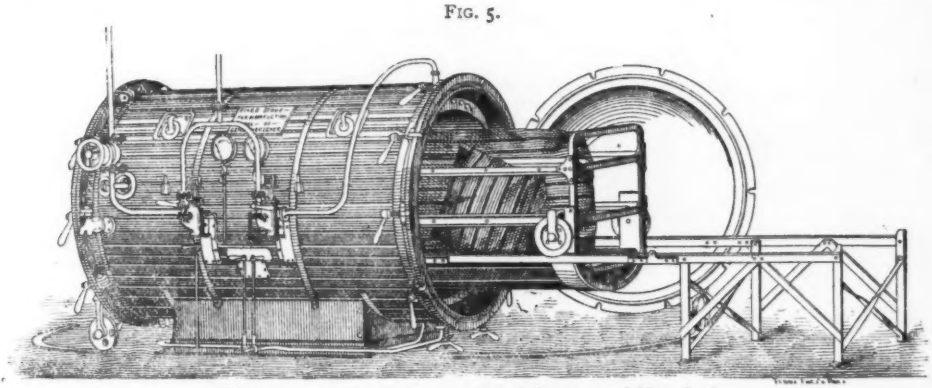
FIG. 4.



Geneste and Herscher's pump for disinfection by pulverizations.

The description which I have just given applies to the fixed stoves, but this arrangement may be varied according to circumstances, and one of the most useful modifications is that which consists in making these stoves portable. The figure which I here show you (Fig. 7) gives you an idea of this portable stove. A locomotive boiler furnishes the steam under high pressure. By means of this useful apparatus we may now disinfect on the spot infected objects, and in the recent epidemic of *sweating sickness* (*suette miliaire*) which prevailed in Poitou, these portable stoves were employed with great success. Several of these stoves have been recently assigned to the various cantons of the department of the Seine to help in stamping out the epidemics now prevailing there.

FIG. 5.



Fixed stove for disinfection (model of Geneste and Herscher).

It may be asked from an economical point of view if these stoves do not injure the clothing and other objects subjected to disinfection?

The very complete report of Vinay gives a decisive answer to this question.* His very careful and thorough experiments have shown that the injury received by the objects placed in the stoves is extremely slight. Only when the clothing is soiled by fæcal matters and by blood there remain indelible stains. Hence Vinay advises a previous washing of all soiled clothing before disinfecting, and for this purpose he makes use of water containing a little permanganate of potash in solution.

As for the rapidity of the disinfection, it is very great, for at the end of fifteen minutes of subjection to the heat of these stoves all the pathogenic microbes are destroyed. But if objects of wool, cotton, and linen can stand the action of steam under pressure, it is not so with animal substances used for wearing apparel, such as shoes, gloves, and furs. It is curious to observe the effect of these stoves on gloves or shoes: they shrivel up, and to such a degree that they will no longer fit on to the hands or feet of any one unless it be a young child; hence, for these common articles of raiment you must have recourse to other processes.

In Germany and in Russia, where fur is so necessary a part of the wearing apparel, they make use of fumigations of chlorine and solutions of carbolic acid. In France we employ either chlorine or sulphurous acid. I need not go back again to the subject of sulphurous acid, concerning which I have already said enough, and shall complete what pertains to the disinfection of garments by a brief mention of chlorine.

Chlorine may be obtained either by the action of hydrochloric acid on binoxide of manganese or from chloride of lime. The method ordinarily adopted by the hospitals is that which was proposed by Professor Regnault,† as one which gives the best results for the disinfection of objects of bedding:

> Dry chloride of lime, 500 grammes;
> Hydrochloric acid, 1000 grammes;
> Water, 3000 grammes.

In an earthen basin you mix the acid and the water, and just as you are about to leave the room you throw in the chloride of lime; you thus set free about forty-five litres of chlorine. But the most advantageous method is to introduce chlorine by means of a tube into the room previously hermetically closed.

* Vinay, "On the Practical Value of Disinfection-Stoves." Lyons, 1887.

† *Traité de Pharmacie*, 1875.

Hence, in all the establishments of disinfection which exist in Germany and France, it has been found necessary to supplement the hot-steam-disinfection stove by a room in which chemical disinfection is practised, and the figure which I here place before you gives you a good idea of the arrangement which has been adopted for carrying out this chemical disinfection (Fig. 8).

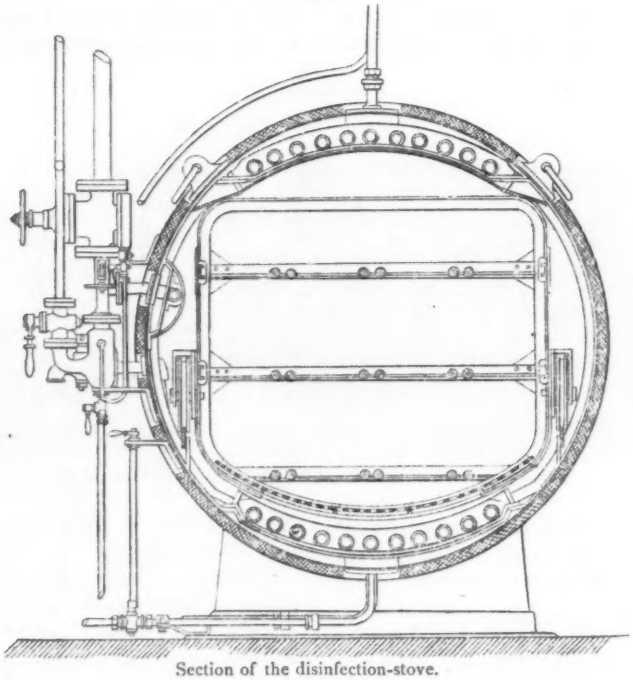
Now that you know the mode of disinfection of objects of bedding and garments, I ought to say a few words about the way to put it in practice, and here there are three circumstances to be taken into consideration; either you have to do with a hospital, a large city, or a commune district.

As for hospital disinfection, I must again refer you for a model to the manner of disinfection at the hospital Alexander at St. Petersburg. As soon as a patient enters the hospital, in the reception building, and before he is admitted to the wards, he is deprived of his garments and takes a bath. His clothing is then transported in a covered wagon to the disinfecting hall. The furs and shoes are placed in a fumigation apartment, where they are subjected to the action of chlorine, and where they remain forty-eight hours; the other articles of raiment are disinfected in the hot-steam chamber. Then, when the disinfection is complete, all the objects are removed to a ventilation room, where they are thoroughly aired in draughts admitted through openings in the walls. The disinfection of bedding, linen cloths used in dressings, etc., is always effected in the stove.

As for the large cities, there is a tendency to institute public establishments for disinfection, and Paris will have no cause to envy other cities in this respect, thanks to the efforts of the Municipal Council, which is about to establish two public disinfecting stations, the one on Vannes Street, No. 166, the other on Récollets Street. Berlin, which has a very complete service of disinfection, has effectively equipped the building set apart for that purpose, and the admission of all infected objects takes place through a special court, distinct from another court through which all disinfected objects pass out; different tracks are used in both cases. There is but one fault to find with this establishment,—namely, the stove employed, which is very inferior to that constructed by Geneste and Herscher, especially as far as the rapidity of disinfection is concerned.

As for the commune districts, disinfection

FIG. 6.

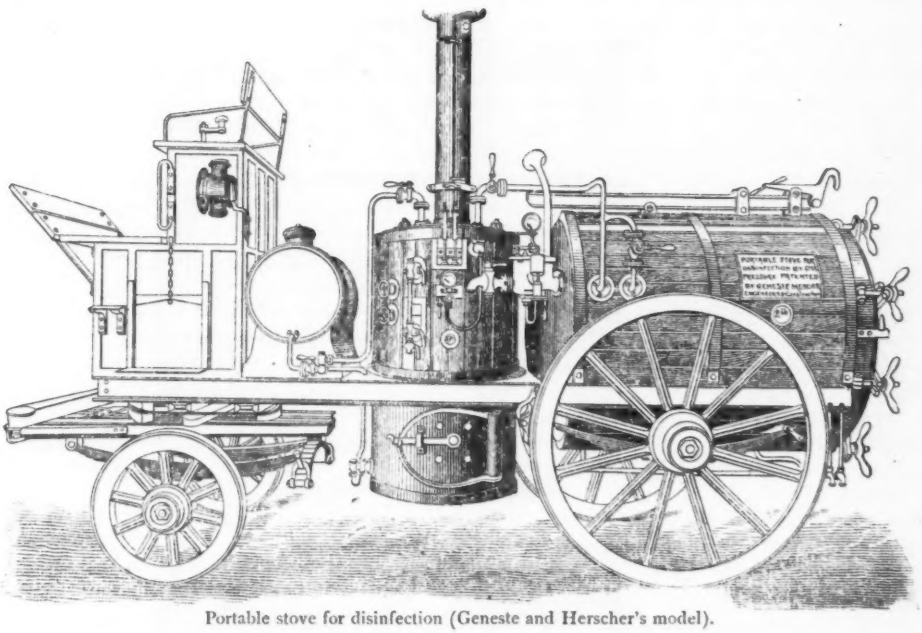


Section of the disinfection-stove.

may be carried out by means of the portable stoves, and I have already told you that in the recent epidemic of *suette miliaire* which has prevailed in Vienne and Haute-Vienne these stoves have been put in usage, and have rendered good service. But these stoves are hardly suitable for use except in grave epidemics, and in contagious diseases of medium intensity it is better to have recourse to other means. In these cases you can only employ washings with sublimate, 1 per 1000, with cupric sulphate solutions, or the fumigations. It is for the sanitary officer to decide which one of these means he will employ, choosing that which seems best adapted to the occasion. I come now to a more difficult subject, that of the disinfection of persons.

There is no doubt that persons who have been in contact with patients affected with infectious diseases may be the conveyers of contagion. The skin or the garments may be a lodging-place for pathogenic microbes, which, transported to an individual in a fit state of receptivity, may engender disease. Such facts have been recorded with reference to scarlet fever, smallpox, and other specific fevers; they have also been noted in connection with diphtheria, as the very convincing observations of De Cresantignes go to show.*

FIG. 7.



Portable stove for disinfection (Geneste and Herscher's model).

But surgery and obstetrics have given us the most positive proofs of this conveyance of contagion, and it is to-day admitted without dispute that in a great number of cases it is the surgeon or the accoucheur who is oftenest responsible for the septicæmia of the wounded or of the puerperal patient. In this connection permit me to allude to the curious experiments of Kümmel, who, by plunging the hands into gelatin, observed how thorough was the washing required to render the hands absolutely aseptic. He has shown that there are hands which cannot be got clean, and which, despite all the care, always give rise under such circumstances to colonies of microbes. These experiments seem to explain the success or want of success of certain surgeons; I shall return to this point presently when I come to speak of the disinfection of the hands and of instruments.

In fact, the disinfection of persons comprises the disinfection of the clothing and that of the skin. To effect the first, it was formerly the custom to place the individual to be disinfected in a fumigation-box, where, the head only being allowed to protrude, the whole body was brought into contact with chlorine or sulphurous vapors. This process is now carried out at the Royal

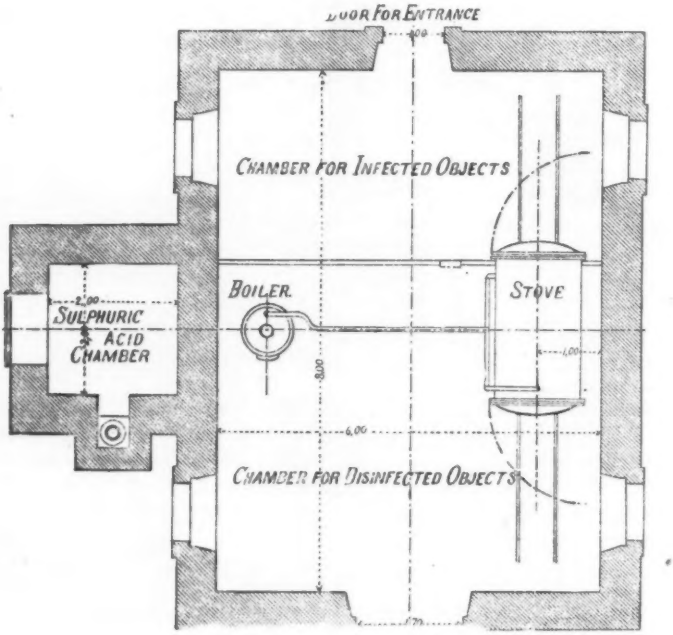
* De Cresantignes, "Contribution to the Etiology of Diphtheria Contagion by the Intermediation of a Healthy Subject" (*Bulletins et Mèmoires de la Société de Médecine pratique*, July 5, 1888, p. 505).

Maternity of Copenhagen, also in the smallpox hospitals of Switzerland, Germany, and Italy.

But such practices are very difficult of execution, especially in our hospitals, where the medical staff is quite large. Hence the disinfecting cabinet has been for the most part given up, and our hospitals have adopted the usage of a special suit of clothes for the infected wards, and in particular of a long linen robe, and it is made obligatory upon the medical staff, in hospitals set apart for smallpox or other contagious diseases, that they shall never go outside the hospital wearing the same clothes that they wear in the hospital.

teria, and that what is needed is a thorough washing of the hands with the help of the brush for three minutes with warm soapsuds, then for one minute with carbolized water (five per cent.), to destroy the microbes. The results of these experiments have been confirmed since then by Gaertner and Forster. But when the hands are infected by the performance of an autopsy these precautions are not sufficient, and this is what one ought to do to rid his hands of all micro-organisms: scrub with the brush for five minutes with black soap and warm water, then for two minutes (still using the brush) with a mixture of equal parts of chlorine-water and dis-

FIG. 8.



Plan of a building for disinfection.

As for the care to be taken to disinfect the person, this consists in baths, and frequent washings of the face and hands. It should be required that the beard shall be always clipped short, and that the head shall be almost shaved. At any rate, the utmost pains should be taken in cleansing the hair and the beard. But it is to the disinfection of the hands that attention has been especially directed. In his experiments, Kümmel has shown that cleansing the hands with the brush for five minutes with soap and warm water and scrubbing with boiled water never prevent the development of colonies of bac-

tilled water, or with a 1 to 20 carbolic solution. But the nails always give the most trouble and demand the most care in cleansing, and they should always be kept cut very short.

Jules Roux and Reynés have lately made some interesting experiments (*Acad. des Sciences*, November, 1888). After successive scrubbings they cleaned out, by means of a sterilized wire, the sub-ungual space, and sowed the products on gelatin or agar-agar. No washing or scrubbing of the hands with warm water and soap, followed by carbolic water (ten per cent.), prevented under these

circumstances the development of micro-organisms. To accomplish this it was necessary to do as Furbeinger recommends. We quote his directions:

"1. Dry-scrape the nails and the sub-ungual space;

"2. Wash and brush with hot soapsuds a minute at least;

"3. Wash and brush with alcohol at 80° for the same time;

"4. Before the complete evaporation of the alcohol make a final cleansing with the antiseptic solutions, using again the nail-brush."

According to Furbeinger, when these precautions have been taken, the scrapings of the sub-ungual space have always been sterile. Roux and Reynés, however, have obtained less favorable results, complete asepsis being realized in only fifty to eighty per cent.

To obtain antisepsis of the skin, solutions of permanganate of potash have also been proposed. We are indebted to Danlos for the suggestion to wash the hands in a 5 per 1000 permanganate solution. The brown discoloration caused by this solution can be removed by soaking the hands in a solution of bisulphate of sodium, 1 to 5. Antiseptic soaps have also been advised, and antiseptic aromatic lotions; here are some of these formulæ as given by Helot:

ANTISEPTIC SOAP.

Boric acid, 15 grammes;
Crème de Savon of the perfumers, 90 grammes. M.

AROMATIC LOTION.

Acid thymic, 1 gramme;
Alcohol at 90°, 4 grammes;
Distilled water, 1000.

Mollard has made sulphurous acid soaps; others soaps with carbolic acid, thymol, etc.

Such are the general rules applicable to the disinfection of persons. You ought to insist on these rules being carried out by nurses or members of the family who are in direct contact with the patient. You will tell them to wash their hands whenever they touch the patient or handle his dejections, using for this purpose solutions of sublimate or thymol, 1 to 1000; you will enjoin on them the necessity of not merely keeping the hands and the nails scrupulously clean and aseptic, but also of frequently washing the face, the hair, and the beard; they should, moreover, often take full baths; you will forbid them to eat and drink in the room of the patient; lastly, you will prohibit them from going out with the same clothing on that they wear in the sick-room. It only remains for me now to speak of the disinfection of dejections, a matter of some importance.

Since bacteriological research has revealed the presence of pathogenic microbes in the dejections, the necessity of thorough disinfection of these dejections has become one of the most important points of prophylactic hygiene. There are two diseases in particular where the contagion is propagated almost exclusively by the excreta,—typhoid fever by the fæcal matters, and pulmonary tuberculosis by the expectoration.

As Vallin has said in his remarkable report on the contagion of tuberculosis, we are warranted in affirming that the products of expectoration are unquestionably the principal agent in the transmission of tuberculosis. There is, then, an urgent demand to destroy the virulence of these sputa.

If you will refer to the experiments of Schill and Fischer, you will see that these sputa, especially in the moist state, present an extreme resistance to our agents of disinfection, and only heat is the sure means of destruction of these virulent products.

Yersix affirms that the bacilli of tuberculosis (sporules or bacteria) are destroyed when they are subjected to a temperature of 70° C. for ten minutes. I believe that in practice this temperature ought to be considerably higher, and raised to at least 100° C.

It is very difficult to carry out this disinfection of sputa. In order to succeed, you must forbid the patients to expectorate on their handkerchiefs, napkins, or on the ground, and you must insist on their expectorating in their spittoons. These should be furnished with saw-dust, which may be kept moist with any one of the following mixtures recommended by Vallin, although the destructive action of these antiseptic preparations on the bacilli of tuberculosis is not equally demonstrated with respect to each one of the series:

1.

Chloride of zinc (liquid at 45°), 100 grammes (3.2 ounces);
Glycerin and water, 1 litre (1 quart).

2.

Chloride of lime, 50 grammes (1.6 ounces);
Water, 1 litre (1 quart).

3.

Crystallized phenic acid, 5 grammes (77 grains);
Water, 900 grammes (1 pint, 14 ounces);
Glycerin, 100 grammes (3 ounces, 3 drachms).

4.

Crystallized thymic acid, 2 grammes (30 grains);
Alcohol, 50 grammes (1 ounce, 5 drachms);
Water, 900 grammes (1 pint, 14 ounces);
Glycerin, 50 grammes (1 ounce, 5 drachms);
Crystallized sulphate of copper, 50 grammes (1.6 ounces).

5.

Nitric acid, 50 grammes (1.6 ounces);
Water, 850 grammes (1 pint, 12 ounces);
Glycerin, 50 grammes (1 ounce, 5 drachms).

Then, at the end of the day, you will destroy more completely the virulence of the sputa by emptying the contents of the spittoons into the fire, which is the most radical means, or by subjecting them to boiling water or to steam. Two sorts of apparatus are actually in usage to attain this end: the one, devised by Dr. Lallier, utilizes a jet of steam from the steam-boiler of the establishment; the other, constructed by Geneste and Herscher, accomplishes the thorough cleansing and disinfection of the spittoons in a vat by means of a jet of boiling water made to play upon them for about five minutes; this is done in a little kitchen adjoining the ward. Smaller apparatuses constructed on the same plan may be employed in private families.

The problem is still more difficult when the disinfection of fæcal matters is to be effected, and we here come to one of the most grave questions of prophylactic hygiene.

Hitherto most of the means advised for the disinfection of fæcal matters have consisted rather in a deodorization of those matters than in a destruction of their morbid germs. Thus it is that peat and earth have successively been proposed: sulphate of iron has been oftenest used, and this salt is especially indicated in the orders of the prefect of police given with reference to the disinfection of dejecta. The proportion ordinarily called for is five kilogrammes of ferrous sulphate to each cubic metre of matters to be disinfected. At Lyons, the heavy oils of coal are much lauded; these oils seem to have a much more decided microbicide action than the ferrous salt above mentioned.

But here, also, heat is much the most effective agent, and you may by the aid of steam under pressure absolutely destroy the virulence of fæcal matters. I saw at St. Petersburg, at the hospital barrack Alexander, a very ingenious apparatus constructed according to the directions of Dr. Wassilieff, in which all the fæcal matters were subjected in a continuous manner to the influence of high-pressure steam. This apparatus has been employed chiefly in cholera and typhoid fever, and there is the greater necessity for something of the kind at St. Petersburg from the fact that this city has no sewers, and all fæcal matters ultimately find their destination in the soil. In Paris during the epidemic of 1884 Durand-Claye and Masson attached to the Marine Hospital an apparatus which subjected to intense heat (in fact, *cooked*) all fæcal matters before they were delivered to the sewer.

But such a disposition of excreta as this can be applicable only to particular cases, and cannot become of general availability, as in the case of large bodies of people. Other means of disinfection have, therefore, been sought, and for the large cities it has been proposed to subject all fæcal matters to chemical changes which shall transform them in large part into ammonium sulphate, or even to make use of the soil as a means of disinfection.

I cannot here enter into this great question of sewerage, a social and hygienic theme which would require many lectures to deal thoroughly with. I can only indicate the general outlines of the subject.

The sewerage system may be referred to three principal types. In the first, or "depository" system, to-day condemned by all hygienists, the sewage is gathered into immense heaps, where it is subjected to the action of the air, which dries it and transforms it into a powder, which is disposed of for agricultural purposes. Another system consists in rapidly transforming chemically the sewage conveyed into special factories, where, by successive modifications, the active principle is extracted under the form of ammonium sulphate. A third system consists in conveying the fæcal and refuse matters, with or without surface-drainage waters, to the soil, where it serves for manure, or to some river, or to the sea.

The conduction of sewerage to some near water-course ought to be abandoned, for the presence of these matters pollutes and contaminates these waters, and is a source of contagion and the propagation of infectious diseases. Nor can much be said at the present day in favor of the system of privy-vaults and cesspools, which are an abomination. The movable-closet (*fosse-mobile*) system is an improvement on the above; here the excreta are removed in pails or barrels to some central depot, where they are chemically transformed or destroyed. To this system for the disposal of sewage may be joined the pneumatic system now in vogue

in some parts of Paris, whereby the fæcal matters are sucked (pumped) from the privies to a central depot, where they are converted into a fertilizing powder for the farmers in the country. This system, called the Berlier system, is operative in the Madeleine quarter, and at the Pepinière barracks over a net-work of ten kilometres in extent, and is a good one for many places, but it is hardly applicable to large cities in their entirety; moreover, it does not entirely do away with the privy-vault nuisance, and still leaves a certain amount of excreta in the vaults. A system very similar to the above is that of Waring, which has been in use in Paris since 1884; by this system the slops and refuse of the houses, mixed with the fæcal matters, are swept along by masses of water in glazed earthenware pipes, the ultimate destination of the sewage being the same as in the Berlier system.

There remains the question of the final disposal of sewage, and leaving one side the conveyance of slops, filth, and excrement into water-courses, which, as before said, is a system to be condemned, only two systems remain for discussion. In the one, the fæcal matters are conveyed to the soil by a provision of air-tight tanks and pipes; this is the Liernur pneumatic system, which has been tried at Brussels and Amsterdam. In the other, all refuse matters, house filth, etc., go into the main sewers, and are carried to the land and utilized for agricultural purposes.

The advocates of this system of sewage disposal have alleged the following arguments therefor: first, the method is an economical one, inasmuch as the filth of the towns constitutes a fertilizing material of exceeding value for the land; then, again, the sewerage waters are rapidly appropriated by the soil and undergo complete purification there, as has been demonstrated by chemical analysis and by bacteriology, on condition, however, that the ground be permeable, and that it be well worked over, with rich crops as the result. It must be provided, moreover, that the quantity of sewage thus disposed of shall not be too great for the area of ground submitted to its influence.

The opponents of this system have maintained that it is not yet proved that the soil absolutely deprives sewerage matters of their pathogenic microbes, and that the vegetables or cereals grown on such soil will not be contaminated by these microbes, and, in particular, by those of typhoid fever. They have also insisted on the ultimate saturation of soil that has for a series of years been the receptacle of so much filth (the land is said, in common parlance, to become *sick* of sewage), and they have appealed finally to statistics to show that the occupants of these sewage farms are more or less subject to infectious diseases.

The problem does not seem yet to be solved, and at the same time it must be admitted that the advocates of these systems of sewage disposal have the best of the argument, and for the following sufficient reason: a certain number of large cities have adopted the system, and have had experimental proof of the benefits thereof, and, as an instance, I may refer to Berlin, a city which makes so much account of public hygiene. I think that there would even be unanimity on this point if the quantity of sewage waters to be distributed to the lands could be limited to so much a hectare and so much a year,—say ten thousand cubic metres per hectare, which would never exhaust the capability of the soil for the filtration and purification of these matters. This estimate is even considerably smaller than conclusions drawn from trials made in the plains of Gennevilliers seem to warrant, and which raise the figure to forty thousand cubic metres per hectare.

Hence, then, in order that this system of sewage disposal may give all the results that hygiene demands of it, it must fulfil the following conditions: the sewers should be laid so that there shall be a sufficient fall to insure a rapid flow of the waste waters; their walls should be perfectly tight, so that there can be no leakage; the quantity of excreta which flows through them should be estimated at about ten litres per day for each inhabitant; lastly, the soil that is to be the final recipient of this refuse must be porous and under thorough cultivation, and the quantity of sewage disposed of should not exceed forty thousand cubic metres per hectare (2.5 acres).

This lecture is already long, nor have I been able to do more than glance at this great question of sewerage. Those who would study it more at length would do well to consult the report of Bourneville, and the interesting work which Rochard has published on Social Hygiene. But it is not enough to have prevented by different means of disinfection the spread of the disease, it is equally necessary that the contaminated individual shall be isolated, and it is this next aspect of the question of prophylactic hygiene that I propose to consider in the following lecture.

ON THE SEPARATION OF MOTOR AND TROPHIC NERVES OF MUSCLE.

ALSO A CONTRIBUTION TO OUR KNOWLEDGE OF THE HEAT-REGULATING MECHANISM OF WARM-BLOODED ANIMALS.

By Geo. T. Kemp, Ph.D. (Johns Hopkins).*

Part I.

IN working with animals under the influence of curare, I have often been struck by the great and rapid fall of their temperature, especially if the work was done in a cold room. From a consideration of this, with the well-known experiments of Röhrig and Zuntz, showing that the total metabolism of the body may be diminished as much as fifty per cent. by curare, and the exceedingly interesting observations more recently published from Pflüger's laboratory,—viz., that a curarized mammal behaves very much like a cold-blooded animal,—I was led to make a more thorough study of the influence of curare on animal heat, instituting experiments which, so far as I am able to learn, have not been made before. As early as 1811 Brodie† advocated the theory that the production of heat in warm-blooded animals was under the control of the nervous system, and later, in 1837,‡ he reported a case of injury to the spinal cord, which was followed by a rise of temperature to 111°. This, it may be said, gave the start to inquiry in this field, and the results of subsequent investigations have more than sufficed to show that there is a most intimate relation between the nervous system and the production and regulation of heat in warm-blooded animals, although the exact nature of this relationship is far from being understood.

Clinical evidence of temperature disturbances following injuries to the spinal cord has been too conflicting to draw any satisfactory conclusion therefrom, and, indeed, in the results of experimental investigations a greater uniformity could be desired.

The early work of Bernard, Schiff, Chossat, Brodie, Bezold, and Tscheschichin gave as a general result that complete section of the spinal cord was followed by a more or less rapid fall of temperature.

Exceptions, however, have been noted. Naunyn and Quincke,§ in reviewing this work, come to the conclusion that the fall of temperature is due to a too rapid loss of heat from the body, and find in their own experiments that if loss of heat be prevented by surrounding the animal with wadding, or placing it in a warm box at a temperature of about 26° to 30° C. (79° to 86° F.), the temperature first falls, and then steadily rises‖ until it passes the temperature of the normal animal. These results were also obtained by Binz¶ in 1870. In observing the enormous rise which Binz finds after section of the cord, it must be borne in mind that he used morphine and chloroform to anæsthetize his dogs for the operation, and when the dog was put into the box its temperature was several degrees below the normal, owing to the influence of these drugs.

These results of Naunyn and Quincke, and of Binz have not stood unchallenged. In 1872 Rosenthal,** agreeing with Riegel, found that, unless the surroundings of the animal were kept at 32° C. (89.6° F.), the temperature fell continuously, and even when a rise was produced by keeping the animal in a box at 32°, the temperature could not be made to pass to any extent above the normal.

The position of Rosenthal and Riegel is supported by Parinaud,†† who found that after section of the spinal cord in rabbits there was a progressive fall in temperature until death. Some of Parinaud's experiments lasted for several days, and were performed at the Hôtel Dieu in Paris during the summer months, when the temperature of the laboratory was about equal to that of the hot box used in Naunyn and Quincke's experiments. He thus avoided the source of error derived from the saturation of air with moisture, which resulted from the arrangement employed by Naunyn and Quincke for heating the chamber in which to put the animals. Parinaud's animals were placed in surroundings as favorable as possible for results of the greatest reliability. The importance of this difference must not be underestimated, for Naunyn and Quincke used dogs in their experiments, and these animals rely on quickened respiration and consequent increased evaporation from the lungs as the chief means at their command for getting rid of an

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† *Phil. Trans.*, 1811 and 1812.

‡ *Med.-Chirurg. Trans.*, vol. xx. p. 119.

§ *Archiv für Anatomie und Physiologie*, 1866, p. 176.

‖ Op. cit., p. 180.

¶ *Virchow's Arch.*, vol. li. pp. 13–20.

** Rosenthal, "Zur Kenntniss der Wärmeregulirung bei der warmblütigen Thieren," Erlangen. Quoted from *Hoffman and Schwalbe's Jahresbericht*, vol. i., 1872, p. 575.

†† *Archives de Physiol.*, 2ième série, vol. iv., 1877, pp. 63–82 and 310–333.

excess of heat from their bodies. Another feature of Parinaud's work is that the temperature was taken at different parts of the body simultaneously, and the rectal temperature was not relied upon entirely as an index of heat throughout the body.

This is quite an important point, and is needed to supplement other observations in this field in which similar precautions were not taken; for it is perfectly conceivable that the distribution of blood in the body may be such as to give a lowered temperature in the rectum without the other parts of the body being so affected.

It is evident from the foregoing that the bodily temperature is profoundly affected by cutting the spinal cord, and it now concerns us to decide in what way such injury produces its effects.

The maintenance of a constant temperature by warm-blooded animals is clearly dependent upon two things,—viz., the amount of heat produced in the system and the amount of heat given off by the body, either directly as heat, or in some other form of energy.

In animals, such as dogs and rabbits, in which there is very little sweating, an excess of heat must be controlled almost entirely by increased respiration, or by an increase in the loss of heat from the surface of the animal's body to the surrounding air.

Cutting the cord does not increase the respirations, so that this factor may be disposed of; but it does very materially increase the dissipation of heat from the body. It is a well-known fact that cutting the cord causes an immediate fall in the general blood-pressure of an animal, and much discussion has arisen, on both theoretical and experimental grounds, as to whether this had increased dissipation of heat for its consequence. A reopening of this discussion is now not necessary, for Wood,* in his elaborate research on fever, has abundantly shown by direct calorimetric observations that section of the cord above the splanchnics is followed by a very great increase in the amount of heat dissipated in a given time. Thus the fall in temperature which follows dividing the cord could be explained by the excessive loss of heat from the animal's body, but we have evidence that its action is more far-reaching than this.

In the first place, the influence of a fall of blood-pressure on the oxidation in the tissues, and a consequent alteration in heat-production, is by no means impossible, and physiologists of such note as Haidenhain,† after considering all the evidence up to their time of writing, have denied the existence of a thermotaxic mechanism in the body, and have placed the regulation of animal heat entirely in the hands of the vaso-motor system. Since the time that Haidenhain so warmly defended this theory, there has been a steady increase of evidence pointing to the direct control of animal heat by the nervous system, so that we are hardly permitted to entertain doubts on the subject at present. In fact, we have strong evidence that cutting the cord causes a fall of bodily temperature, not only by increasing the amount of heat dissipated, but also by diminishing the amount of heat produced, and this, indeed, by direct action (or, more probably, cessation of action) of the nervous system on the metabolism in the individual cells.

Thus Pflüger‡ has shown that cutting the cord at the sixth or seventh cervical vertebra may reduce the metabolism of the body about one-half, as measured by the amount of O consumed and CO_2 excreted. And these results are directly confirmed by Wood's§ calorimetric observations, which show that section of the cord is followed by a diminution of heat produced, amounting to from ten per cent. to eighty per cent.

The study of the effect of *curare* on metabolism has also yielded much valuable information on this subject.

Röhrig and Zuntz‖ found that in curarized animals the consumption of O and the elimination of CO_2 were enormously diminished. Their results were confirmed by Jolyet and Regnard,¶ who, using Regnault and Reiset's apparatus, found curare that diminished metabolism more than section of the medulla; and also in the following year by Pflüger, in his celebrated paper "Ueber Wärme und Oxydation der lebendigen Materie,"** in which he

* "Fever: A Study in Morbid and Normal Physiology."—*Smithsonian Contributions to Knowledge*, No. 357.

† *Arch. f. d. Gesammt. Physiol.*, vol. iii., 1870, and vol. v., 1872.

‡ *Arch. f. d. Gesammt. Physiol.*, vol. xii., 1876, p. 284

§ Op. cit., p. 45.

‖ *Arch. f. d. Gesammt. Physiol.*, vol. iv., 1871, pp. 84–86; vol. xii., 1876, pp. 522–528.

¶ *Gaz. Méd. de Paris*, 1877, pp. 179 and 190. Quoted from *Hoffman and Schwalbe's Jahresbericht*, vol. vii. p. 328.

** *Arch. f. d. Gesammt. Physiol.*, 1878, vol. xviii. p. 302.

gives as the results of many experiments, that the excretion of CO_2 is diminished about 37.4 per cent., while the consumption of O is diminished 35.2 per cent., thus adding the interesting observation that the respiratory coefficient is practically unaffected.

Certain drugs, such as ether, chloroform, phosphorus (in large doses), etc., have been shown to lower metabolism, and this probably by direct action upon the protoplasm of the cells. To show that curare acts on the nerves and not on the cellular protoplasm, Colosanti* made the following experiments. Dogs were killed by bleeding, and then artificial circulation was kept up through each thigh. The blood passing through one thigh was pure, while curare was added to the blood which supplied the other. Both specimens of blood were then examined, and it was found that a considerable amount of oxygen was used up in each specimen. Just as much, however, was taken from the curarized blood as from the pure blood, which showed that curare did not affect the oxidizing power of the tissues themselves. This is not absolutely a crucial test, as Colosanti himself points out, for bleeding the animal to death would certainly affect the vitality of the tissues, but it serves at least to render the truth of his deductions in the highest degree probable, and is weighty evidence to show that all the striking effects produced in metabolism by curare are wrought exclusively by its action on the nervous system.

We have thus seen that direct lesions of the nervous system, and also drugs (curare) which are known to have a paralyzing action on certain nerves will cause a lessened chemical activity of the protoplasm in the cells of the body, and we have with great probability excluded the possibility of this action of curare being other than through the nerves; thus we have all we can desire in the form of negative evidence to show that oxidation in the tissues, and consequently the production of heat, is directly controlled by the nervous system. But a certain amount of positive evidence is also forthcoming.

Liebermeister† contended that an increased production of heat in the body could be reflexly produced by subjecting the body to sudden cold. He based this theory upon the scarcely sufficient foundation of the fact that a rise of temperature in the axilla follows a sudden withdrawal of heat from the body. He defended his theory for several years, and finally‡ brought stronger experimental proof to his aid in the experiments of Gildemeister,§ made under his direction.

Gildemeister found that there was an increase of CO_2 given off from a man while in a cold bath, more of the CO_2 being excreted the colder the bath. (The lowest temperature used was 18° C. (64.5° F.).) A reflex excitation of metabolism had previously been obtained by Sanders-Ezn.‖ Röhrig and Zuntz¶ likewise obtained a reflex increase of metabolism, as did Pflüger also, who made the additional important observation that a point was reached for low temperatures, below which the system was unable to react; and then the metabolism of a mammal was similar to that of a cold-blooded animal. He also found that when an animal was curarized and placed in a hot or a cold bath, its body readily took the temperature of the bath, and then raising the temperature of the bath increased metabolism, while lowering the temperature diminished metabolism accordingly, thus showing that a mammal thoroughly under curare has its heat-regulating mechanism practically destroyed, and behaves precisely as a frog or other low animal in which no heat regulators exist.

Zuntz** has recently added another observation of intense interest to those already given. He finds that in curarized rabbits kept at a constant temperature in a bath, the amount of O consumed and CO_2 excreted (Gaswechsel) remained constant for a whole day, and, so long as the rabbit was in this state, *it was impossible to induce fever* by septic injections which produced a raging fever in uncurarized rabbits in a few hours.

It has been the tendency of authorities for some time to refer fever to nervous action entirely, and here we have strong evidence in favor of this assumption, towards which many facts have been pointing, but for which experimental proof has been lacking. We find, therefore, abundant evidence to show that there is a nervous mechanism in the body of warm-blooded animals which controls the production of heat. When the body is ex-

* *Arch. f. d. Gesammt. Physiol.*, vol. xvi., 1878, pp. 157–172.

† *Arch. f. Anat. u. Physiol.*, 1860, pp. 520 and 589. Quoted from Rosenthal in *Hermann's Handbuch*, ed. 1880, vol. iv. p. 413.

‡ *Virchow's Archiv.*, vol. ., 1871, p. 130.

§ Gildemeister, "Ueber die Kohlensäureproduction bei der Anwendung von kalten Bädern und anderen Wärmeentziehungen." Basel, 1870.

‖ *Ludwig's Arbeiten*, 1867.

¶ Op. cit., p. 90.

** *Centralbl. f. d. Med. Wiss.*, 1882, p. 562.

posed to colder surroundings, and more heat is given off, the afferent nerves from the skin arouse the proper centres, and we have an increased chemical activity of the cells, reflexly brought about, so that more heat is produced and the temperature of the body does not fall. In maintaining the temperature of warm-blooded animals, the vaso-motor system also plays a conspicuous part, for when the body is exposed to cold there is a constriction of the vessels in the skin, and consequently less heat is given off. When this is very marked, the erector pili muscles take part, and give rise to the appearance of "goose-flesh."

Besides the heat-*producing* and the vaso-motor functions, the nervous system probably exerts other influences on heat-regulation, whose importance must not be overlooked,—viz., the heat inhibitory. Several observations are on record to show the probability of centres above the line of juncture of the medulla and pons, which exercise a marked control on the production of heat in the body. The exact nature and location of these centres has been the subject of much dispute. Injuries to the brain are frequently followed by a rise of bodily temperature (107° to 108° F.), without any very apparent vaso-motor disturbance. This is especially the case where the surface region of the pons is the seat of the lesion.

Tscheschichin, Wood, Eulenberg and Landois, and Ott all find that section of the medulla from the pons is followed by a rise of temperature. This is denied by other observers, but the positive results of the above authors are too striking to be without significance. Bechterew and Hitzig and others find that destruction of the cortex in the region of the sulcus-cruciatus of the dog is followed by thermic disturbances in the parts for which this region is recognized as the motor area.

Eulenberg and Landois,* whose communication is the most recent, regard the disturbances as due to the lesion of a cortical vaso-motor centre, but Wood,† after a thorough review of the subject, while admitting the possibility of the centre being vaso-motor in function, is more inclined to the view that the centre is a true heat inhibitory one, thus agreeing with Tscheschichin, whose results were the earliest published. Bernard's theory of calorific and frigorific nerves is now generally regarded as founded upon vaso-motor phenomena, mistaken by Bernard for the effects of a genuine thermo-regulating action of the nerves. Having now studied the arrangement by which the nervous system controls the production and dissipation of animal heat, or, in other words, how it is that warm blooded animals maintain a constant temperature, it next becomes of interest to study the nature and seat of this chemical activity which the nervous system so directly controls. We know that every living cell in the body lives by a process of oxidation, or burning up of its contents, and the acquisition of a fresh supply of fuel from the blood, which, in turn, is to be burnt again. The life, therefore, of every cell in the body contributes towards the heat of the whole system.

We also know that the special activity of any gland, such as the salivary glands when secreting, or the glands of the stomach during digestion, is accompanied by an increased amount of heat given out to the blood, and this circulates through the body. Every beat of the heart does likewise, but all this is true of cold-blooded animals as well as of mammals. What, then, does the nervous system call on for increased activity when more heat is needed in the body? Physiological investigation has answered, "The muscles."

We all know how much heat the muscles give off when in a state of activity and motion, but there is a quiet activity in the muscles, which is unaccompanied by any visible motion, and which only involves the motion of atoms and molecules in the muscle-substance itself; this it is that stands the servant of the nervous system, and furnishes more or less heat, as the nerves command, even when, as during sleep, every trace of motion is absent. At present two kinds of nerves are recognized as supplying muscle,—the sensory and the motor; with a possibility of a third variety,—the trophic. The question now arises, By which of these channels do the nervous impulses which control the production of heat reach the muscle? The sensory nerves we know to be excluded, and we have, then, only to decide whether there really exist trophic nerves which govern the metabolism, or whether this function is performed by the motor nerves. Analogy, with certain other tissues, would lead us to believe in true trophic nerves for muscle, and both experimental physiology and pathology furnish good evidence for the existence of trophic nerves to muscle independent of the question of heat;

* *Centralbl. f. d. Med. Wiss.*, 1876, p. 262.

† Op. cit., p. 254.

but, on the other hand, the only nerves which curare has hitherto been known to paralyze are motor nerves. Now, the remarkable influence of curare on the heat-regulating mechanism has already been pointed out, and it has led some physiologists to believe that the influences controlling metabolism reach the muscle through the motor nerves. This is the opinion held by Röhrig and Zuntz,* and also by Riegel,† while Zuntz, in later papers, says the extent to which this function of motor nerves is exercised is more than is recognized, and that all the breaking down of muscle from excessive metabolism of fever is produced through the motor nerves.‡

It was with the object of deciding, if possible, whether the metabolism of muscle was controlled by the motor nerves, or whether a set of true trophic fibres existed, that my experiments with curare were undertaken, and the results of these experiments will be given in the next number.

Before leaving the subject of the heat metabolism of muscle, I wish to call attention to a publication on the subject, which I have not often seen quoted, but which is of great interest in this connection. The experiment is one of Abeles,§ who amputated the thigh of a dog, and then gave curare. At intervals, varying in the different experiments from twenty-five minutes to one and three-quarters hours, he cut off the other thigh. He then estimated the percentage of glycogen in the muscles of the thigh amputated before giving curare, and then the percentage of glycogen in the thigh amputated after the curare had been in the circulation. He found that the muscles of the curarized leg always gave more glycogen than the sound one. The following is a table of three experiments:

Muscles without curare.	Muscles with curare.
2.27	2.46
1.37	1.59
.75	.82

The difference in the percentage is very small and almost within the limits of error of observation, but the short time that the curare was allowed to circulate, and the small percentage of glycogen in muscle at best, would preclude larger figures. These results are very interesting, especially when taken into consideration with the fact that diabetes almost invariably results from curare-poisoning, and they are given for what they are worth in connection with the subject of this paper.

(To be continued.)

* *Arch. f. d. Gesammt. Physiol.*, 1871, vol. iv. p. 90.

† Same *Archiv.*, vol. iv. p. 401.

‡ "Wir wurden so zu dem wichtigen Schlusse geführt, dass ein viel grössere Bruchtheil des thierischen Stoffwechsels als man bisher angenommen hatte, durch Erregung der motorischen Nerven bedingt sei, welche Erregung auch im scheinbar ruhenden Muskel im schwachem Masse andauern und die Grösse von dessen Stoffwechsel bedingen. Im Bewusstsein der Gefahr des Irrens welche die angeführte Momente bedingen, glaube ich doch jetzt über eine genügende Zahl von Versuchen zu verfügen, um den Satz aufstellen zu Können, dass *nur die Innervation der Muskeln der fieberhaften steigerung des thierisches Oxydationsprocesses sei*" (*Arch. f. d. Gesammt. Physiol.*, 1876, vol. xii. p. 522).

§ *Med. Jahrbücher*, 1877, pp. 551–558. Quoted from *Jahresbericht üb. d. Fortsch. d. Thierchemie*, vol. vii. p. 63.

ISO-NITROSO-ANTIPYRIN.

By H. C. Wood, M.D., and John Marshall, M.D., Philadelphia, Pa.

BEFORE the *Western Druggist* of December, 1888, containing the paper of Professor E. B. Stuart upon "The Incompatibility of Spirit of Nitrous Ether and Antipyrin," had been received, our attention had been called to the remarkable change of color which occurs when ordinary sweet spirits of nitre has antipyrin added to it. An abstract of the paper of Professor Stuart has already been published in the Therapeutic Gazette, and we shall, therefore, simply state the results of our own studies, without allusion to what has been done. All the assertions which are made in this article, whether novel or old, have had their accuracy verified by actual experiment.

The discoverer of antipyrin, Knorr,‖ found that nitrous acid produces with antipyrin a new compound, to which he gave the name iso-nitroso-antipyrin, and which crystallizes in small bluish-green crystals, is sparingly soluble in water, and has the formula $C_{11}H_{11}N_3O_2$.

The iso-nitroso-antipyrin is not produced unless the liquid to which the antipyrin is added contains free nitrous acid. Thus, potassium nitrite with antipyrin undergoes no decomposition, and the green compound is not generated, but, on the addition of a stronger acid to such a solution, nitrous acid is immediately set free and the green compound is formed.

Chemically pure anhydrous ethyl nitrite, the principal therapeutic constituent of sweet

‖ *Berichte d. Deutsch. Chem. Ges.*, Bd. xvii. p. 2038, 1884.

spirits of nitre, dissolves antipyrin, but no greenish coloration, indicating the formation of the green compound, is imparted to the solution until the lapse of twenty or thirty minutes.

The production of the greenish coloration under these conditions is due to nitrous acid being set free from the ethyl nitrite by the slow absorption of water from the atmosphere. This decomposition of the ethyl nitrite, with the separation of crystals of iso-nitroso-antipyrin, occurs immediately on the addition of water, as is demonstrated by treating ethyl nitrite containing antipyrin in solution with a few drops of water.

The sweet spirits of nitre of the Pharmacopœia, which is a liquid containing about five per cent. of ethyl nitrite, almost invariably contains free nitrous acid, varying in quantity from a trace to a visible quantity,—*i.e.*, as shown by the slight brownish-red coloration of the liquid which is sometimes observed.

Of six separate specimens of sweet spirits of nitre obtained at the apothecaries', five changed to a greenish color on the addition of antipyrin ; the sixth did not respond ; but, on examination, no ethyl nitrite was found, and therefore it could hardly be expected to contain free nitrous acid.

The fact that chemically pure nitrite of ethyl does not react with antipyrin is another argument in favor of the adoption by the Pharmacopœia of a standard solution of pure nitrite of ethyl, instead of the present uncertain preparation. Of course such solution should be alcoholic, or at least not watery. (See leader present number of THERAPEUTIC GAZETTE.)

The iso-nitroso-antipyrin employed in the experiments here described was prepared by adding the calculated quantity of potassium nitrite to an acidulated aqueous solution of antipyrin. The liquid became at once bluish green in color, and in a few minutes there was an abundant production of crystals. These were collected on a filter, thoroughly washed with cold water, and allowed to dry on bibulous paper at ordinary temperature.

In preparing the iso-nitroso-antipyrin it was noticed that the filtrate from the crystals changed in color from green to brown, and developed a very distinct hydrocyanic acid odor after standing a few hours. The presence of cyanogen was confirmed by the formation of crystals of argentic cyanide in a drop of argentic nitrate solution placed on a watch-glass and inverted over the beaker containing the filtrate.

Dilute sulphuric acid, hydrochloric acid, and acetic acid act upon solutions of iso-nitroso-antipyrin, causing the evolution of cyanogen, and, indeed, a mixture of equal volumes of a saturated aqueous solution of antipyrin and c. p. ethyl nitrite, without the addition of an acid, undergoes decomposition on standing several hours with the evolution of cyanogen. The quantity of cyanogen produced in this decomposition is not large, and therefore could hardly be a cause of serious trouble.

That this decomposition may occur in the stomach was demonstrated by adding iso-nitroso-antipyrin to a .2 per cent. solution of hydrochloric acid, and keeping the whole at the temperature of the body in a water oven. The quantity of cyanogen evolved is, however, so slight that no danger need be feared. The amount given off in an hour from .5 gramme of iso-nitroso-antipyrin, mixed with fifty cubic centimetres of the .2 per cent. acid solution, is only sufficient to give a few crystals of argentic cyanide with argentic nitrate on an inverted watch-glass, equivalent possibly to less than one-hundred thousandth part of a grain of hydrocyanic acid.

In determining whether the iso-nitroso-antipyrin possessed toxic properties, it was administered under various conditions to dogs and rabbits, but in no case, as the following experiments show, were the slightest untoward effects observed.

Experiment 1.—Very young rabbit ; weight, ¾ of a pound. ½ ounce of saturated solution (.375 per cent.) was injected hypodermically ; no effect was produced.

Experiment 2.—Young rabbit ; weight, 1 pound. ⅛ gramme was given by the mouth ; no perceptible effect, and no reduction of the rectal temperature.

Experiment 3.—Dog ; weight, about 17 pounds. A paste was made with water of 1 gramme of iso-nitroso-antipyrin, and given to the dog on a piece of meat. No deleterious result, or, indeed, any change in the behavior of the dog, could be noticed.

Experiment 4.—Dog ; weight, about 24 pounds. 1 gramme of the compound made into a paste was given to the dog on a piece of meat ; no observable effect. After the lapse of an hour another gramme of the compound was given to the same dog. The dog was under direct observation for four hours after this last portion was given, and not the slightest change in his well-being could be noticed.

Whether ill effects are produced when a

solution of antipyrin and sweet spirits of nitre is administered was determined by giving 1 gramme of antipyrin in aqueous solution to the dog mentioned in Experiment 2, and followed in fifteen minutes by the administration of .5 cubic centimetre of c. p. ethyl nitrite contained in the appropriate quantity of alcohol and water to effect its solution; no ill effects resulted.

Three hours after the above administration of antipyrin and ethyl nitrite, separately, a solution containing 1 gramme of antipyrin and .5 cubic centimetre of ethyl nitrite, with alcohol and water, was given to the same dog; no ill effects resulted.

It should be remembered that on administering antipyrin with sweet spirits of nitre, the iso-nitroso-antipyrin may be produced, and that just as much antipyrin is rendered inert or destroyed as was required in the formation of the new compound, and thus the anticipated therapeutic effect of the quantity of antipyrin originally given is not obtained.

A NEW TREATMENT FOR TUBERCULOSIS.

By John A. Lanigan, M.D., Hyde Park, Mass.

FOR many years I have held a belief which, if it is not entirely new, is, at least, so little spoken of in medical literature (if at all) as to be either considered as an undisputed fact or an unexplored region of thought. I refer to an antagonism between certain cachexias. I have never read anything illustrative of this fact, or anything distinctly setting it forth *as a fact.* I have noticed in the writings of some eminent authors an allusion to the *infrequency* of a certain disease occurring in individuals of a certain other cachexia, but this amounts to little more than a *hint* in the right direction.

However, entertaining this belief, and being led by circumstances as well as choice to the special study of diseases of the throat and lungs, I began to make inquiries to find out if, as there were inherited traits of character that were diametrically opposed to others, there might also be certain *inherited cachexias* that in like manner were antagonistic of each other; and hence, that in the same individual, the one could only exist at the expense of the other.

Prosecuting my studies in this direction, during which time I visited many of the hospitals in this country and Canada, I could not help noting the fact that in no case whatever out of two hundred and fifty cases of phthisis could it be found that *phthisis* and *rheumatism* had ever attacked the same individual consecutively or simultaneously; and, on the other hand, I observed that rheumatic persons had invariably good, healthy lungs. This certainly was presumptive evidence sufficient to warrant me in the suspicion that there *might* be some antagonism between these two diseases.

Could it be that the morbific poison of rheumatism was destructive to the existence of the bacilli of tuberculosis? Such, at least, appeared to be the most natural conclusion.

The bacilli of tuberculosis attack and feed upon the nervous texture of our bodies, for it is this texture *alone* that contains any living matter (bioplasm), and living matter feeds on living matter in proportion to the amount of that in their systems. Now, believing thus, I thought, if it were possible to introduce into the human system a material that would be destructive to the bacilli without in any way jeopardizing the life of the individual, that the only true and scientific method would be found for the *cure* of consumption.

Following in this train of thought, I tried the *hypodermic* injections of a solution of sulphuretted hydrogen, which I believed would destroy the lower order of animal life, but I was somewhat disappointed in this, although I met with an apparent success in several cases by the disappearance of the fever, or, more properly, a reduction of the temperature. This was some time previous to the appearance of the Bergeon method of treatment. Failing in procuring an *antidote* by artificial means, I concluded to try what appeared to me nature's remedy or antidote, and so I resolved on the introduction into the consumptive of the blood of a rheumatic.

The best way to do this I considered was by transfusion, as the hypodermic method appeared out of the question, so, after some difficulty, I succeeded in getting a patient, who had been to a great many excellent physicians, to consent to my method, which was of course the transfusion of blood from a rheumatic patient (one suffering from acute rheumatism) into the vein of a consumptive. I applied this treatment after the usual method (the consumptive being in the same room with the rheumatic) in two cases. The first case, I injected four ounces, each time twice; the second, six ounces only once. In both these cases rheumatism was established in a week. The third case I transfused eight ounces, and there was an increase of temperature to 104°, and after that the temperature fell to 99° (in a

day), but no signs of any pain in the joints or elsewhere. Nevertheless, all three patients did well, their weight increased, temperature was lowered, pulse and other symptoms became normal, and there is every indication that they will do well, for strength, appetite, and everything tending to recuperation are in good condition. The only objection to the method appears to me to be the difficulty to get rheumatics to consent to part with their blood, although really in most cases I believe it is to their benefit.

My method of transfusion is the same as that which is known to every physician, and, as every one knows, there must be a great deal of care taken not to admit any air into the vein. I generally transfuse from the largest vein immediately above the joint affected with rheumatism into the arm of the consumptive.

The operation is simple enough, but two things are necessary,—first, be sure of your consumptive; and next, of your rheumatic. The after-treatment is to build up the nerves. If the patient has lungs enough to stand the operation he will get better immediately. I am willing to answer any questions that may be asked me from any readers or persons desiring information.

119 Fairmount Avenue.

A CASE OF MORPHINE-POISONING.

By T. H. Williams, M.D., Germantown, Tenn.

On the 4th of December, 1888, Mrs. T., æt. 47 years, the wife of a well-to-do mechanic, took twenty-five grains of morphine sulphate in an attempt at suicide. She ingested the amount at 1 P.M. The husband, on his return from work, at 6 P.M., found her complaining and unwell. Sent immediately for me, and I arrived there at seven o'clock. She sent the father and son from the room, and told me she had taken three capsules of morphine, packed as hard as she could fill them.* I despatched the husband in haste for apomorphine and atropine, as I had none with me. He was detained one hour in quest of the order.

At 8 P.M. $\frac{1}{10}$ gr. atropine sulph., given hypodermically.

At 8.30 P.M. $\frac{1}{10}$ gr. atropine sulph. repeated.

At 9 P.M. $\frac{1}{20}$ gr. strychnine sulph., given hypodermically, also amyl nitrite used *pro re nata*.

At 10 30 P.M. the induced current was employed.

At 11 P.M. $\frac{1}{10}$ gr. atropine sulph. repeated.

At 12 P.M. $\frac{1}{20}$ gr. strychnine sulph. repeated; nitrite amyl discontinued.

At 4 A.M. $\frac{1}{10}$ gr. atropine repeated.

At 8 A.M. the antagonism was completed. The patient awoke from her opium sleep rational, but without the memory of what had transpired.

The last insertion of atropine, aided by the synergesic action of the strychnine, passed a little beyond the line of antagonism, as was evidenced by slight spasm of muscles of arm and face, and by the rich scarlet hue of the surface and the tortuous tracts of the arteries of the conjunctiva. In this case, these agents sought out an unpromising ground for competition, as it were; the patient was laboring under the effects of cerebral anæmia, conjoined with spinal irritation. When I saw her at seven o'clock this lethal agent ingested showed no disposition to hasten its work. Six hours had elapsed, not a sign of narcotism was present, and it was only after halting, doubting, and consideration that the above plan of action was formulated. Her condition was so at variance with her statement. Her mind was as clear as usual, and she took part in such topics as the occasion brought. Aside from a momentary doze, a trembling gait, and a pin-hole pupil, grave doubt as to the patient's veracity would have risen in any mind, especially when the lapse of time was taken into account since the ingestion of the drug. At half-past eight, when the second insertion of atropine was given, there was no trace of the former dose visible in the eye or upon the circulation. At nine o'clock a change came over the scene. Not a doubt could be entertained now of the truth of her statement. The effects of the atropine manifested itself in the pupil but for a short while. Somnolence now ensued, followed up, in an incredibly short time, by coma. The pulse became too rapid and intermitting to count, and losing often as much as two rhythmical systoles of the heart's action. At half-past nine the respiratory centre failed, after it had undergone a rapid decline for one-half an hour, and the heart took part in the menaced dissolution. Artificial respiration was practised, and amyl nitrite used to prevent sudden heart failure. The strychnine could not save the respiratory centre; it

* Three capsules were taken from the box she had and filled as she directed and weighed.

was rapidly overwhelmed. At half-past ten o'clock the induced current was magical in its effects, and was used throughout the restorative efforts. The poles were disposed after the following manner: The anode at the lowest conjoined root of the phrenic nerve; the cathode three inches below the ensiform cartilage and a little to the left of the median line, as at this point a respiratory impulse could be easily excited. At eleven o'clock, when the atropine was renewed, its effects were unmistakable, the pulse fell to 120,—the respiration rose to 10 impulses per minute, and could *maintain this number* for several minutes without faradic interference. At twelve o'clock the strychnine was also repeated, and, as all exigencies seemed met, the faradic current alone was used. At 4 A.M. the pupil seemed to be losing the effects of the atropine, and was drawing to a pin-hole condition, when $\frac{1}{10}$ gr. was repeated, and in one hour its effects were unmistakable: the work of antagonizing was drawing rapidly to a close. At eight o'clock the antagonism prevailed, reason returned, and, aside from weariness, the patient made no complaint and requested a little nourishment. The morphine was ingested at 1 P.M.; the toxic effect set in at nine o'clock, and this occurred after the second dose of atropine; eight hours elapsed before this agent began its work of death. A faulty assimilation must have been the bar to its entrance. That there exists an antagonism between these agents there cannot be a doubt; but under such conditions as herein related, where so much time had elapsed and every avenue barred and blocked, the race must of necessity be unequal. Yet it will in all probability be held by many that if the $\frac{2}{3}$ gr. of atropine employed in the antagonism had been given at the beginning the crisis of narcotism would have been *averted*, and the centre of respiration been so stimulated as to prevent its being overwhelmed by the opium salt. As to the disposition of this matter, grave doubts must be entertained on remembering the fact how rapidly the lethal effects were observable after two doses of the atropine were inserted. Possibly this might have been the design of nature's action to withhold or detain the drug, admitting only a small quantity at a time, making it possible for the systemic organs to receive and eliminate the poison as rapidly as assimilated. Yet I will insist that while atropine antagonizes opium and its derivative, there are conditions incident to the effects of this *narcotism* that atropine cannot meet. Nothing can be more plainly exhibited than this fact when the history of unsuccessful antagonisms are examined; there being such a preponderance of the one, it does not admit a possibility of an antagonistic effect. Had a strict reliance been placed upon a $\frac{2}{3}$ gr. of the atropine, the respiratory centre would have been so rapidly obtunded by the narcotism as to engender carbonic acid accumulation in the blood, and, by leading to the exclusion of this centre, to the extinction of every vital organ and every vital action. The extinction of the respiratory centre, the accumulation of carbonic acid, in this as well as many other cases, would have lead to such a condition as would have proved rapidly fatal. It was at this juncture that the *induced current* became a conspicuous addendum; it was this agent that caused a smothered-out function to be renewed; it was this that yielded the mastery of the situation, enabled the respiratory system to depurate the blood of its accumulating carbonic acid, and renew its vital powers at each respiration. There can be no doubt but the strychnine synergising with the atropine rendered its effect more lasting and quickened the antagonism. The rapidly failing circulation in this case was promptly reinstated by the timely use of amyl nitrite; its rapidity and certainty of action on the circulatory system suggested it as the fit agent for this work. When the crisis of the antagonism had been reached, with the aid of this agent and artificial respiration I was able to tide over till the faradic apparatus came. I am well convinced that without the aid of this device my efforts would have been *nil*. The exhaustion incident to the effects of a lethal agent is apparent to every observer, and, after a complete antagonism has been secured, the patient too often perishes from sheer exhaustion, a fact too painfully true. The practice so common in forcing laborious and fatiguing exercise should be deprecated as unrelenting barbarity, whereas the strength should not only be reserved but the body temperature kept up.

A CASE OF POISONING BY HYOSCINE.

By S. W. Morton, M.D., Philadelphia, Pa.

ABOUT one year ago I gave by mistake $\frac{1}{75}$ of a grain of hydrobromate of hyoscine subcutaneously to a patient, himself a physician, and a man of very large stature, weighing not less than two hundred pounds. His nervous system at the time was in a very

irritable and susceptible condition, and the drug was given to relieve sleeplessness, which had resisted all other known hypnotics. No other drug had been given within forty-eight hours.

The following are the symptoms in the order in which they occurred. Our patient was in bed when the injection was given him. Not more than five minutes had elapsed after the administration before he noticed a dryness of the mouth and throat, which was attended by a constant desire but, at the same time, an inability to swallow. This, combined with other strange general sensations, suggested to him that he had taken a new remedy. Whereupon he inquired what I had given him. In a few minutes more his speech became thick, and was accompanied by complete paralysis of the soft palate and the upper lip; the latter hung limp and immovable over the upper teeth, and gave the already much impaired voice a very muffled sound. The pupils at this time were noticed to be slightly dilated. He then arose from his bed and staggered half-way round the bedstead, guiding himself all the while by holding on to the side and foot-board. His movements could not have been more incoordinate had he been drunk from alcohol. During this excursion and for some time after his return to bed, say ten minutes, he indulged in a low muttering, out of which nothing intelligible could be made. His voice now gradually failed, becoming at last but a mere whisper. Clonic convulsions came on in the arms and legs, accompanied by a tetanic condition, which was manifested in opisthotonos; the pupils were widely dilated; the pulse a little slow and full; respiration slow and deep; skin slightly flushed. Here he made motions that he should be propped up, which was done. Soon his countenance became very lethargic, the convulsive movements gradually gave way to complete relaxation, his chin dropped upon his chest, and he was, within from twenty-five to thirty minutes from the time the drug was administered, in a profound stupor, in which the respiration remained slow and full, but was also stertorous; the pulse was slow, full, and compressible, and the pupil continued dilated. The stupor lasted six hours, when he awoke, arose as usual, and was himself again with the exception of some giddiness while dressing, a little difficulty in swallowing at breakfast, apparently due to some remaining paresis of the pharyngeal muscles, and a tendency to walk in a line curving to the left; all of which passed off by afternoon.

Although for the most part of the time deprived of his speech, he must have been conscious till the beginning of the profound stupor; for, on awaking, he related the sensation of dryness of the mouth and throat, the desire and inability to swallow, the getting out of bed, the paralysis of the upper lip, the clonic convulsions, and, most vividly, the sense of discomfort caused by the opisthotonos.

The preparation of hyoscine employed was manufactured in Germany, and obtained by me from Messrs. Bullock & Crenshaw, of this city, who say that it was most probably Merck's.

NOTES ON A CASE OF HYOSCINE-POISONING.

By Joseph S. Gibb, M.D., Philadelphia, Pa.

MR. S., æt. 58, an ataxic, by mistake took hypodermically hyoscine hydrobromate gr. $\frac{1}{60}$, in one dose. The injection was taken at twelve midnight. In a few moments (?) his wife noticed that he acted strangely.

I was summoned 12.45 A.M. (January 24), and found him wildly and actively delirious. His delirium was of a loquacious character, with many hallucinations. He would grasp at imaginary objects, talking incessantly, and was with difficulty kept in bed. At this time he seemed to recognize those about him, but in a short time all recognition failed, though he never failed to answer when loudly called.

His pulse was regular and full, beating 80 to 85 per minute, later 100. Respirations were not accelerated; on the contrary, they were diminished; at first about 18 per minute, they later fell to 14 and became irregular.

Pupils were neither dilated nor contracted, and thoroughly responsive to stimulus of light. There was an imperfect (?) efflorescence of skin. The tongue and throat were somewhat dry, though he was able to swallow. He was keenly sensible of pain and external irritation; would wince sensibly and audibly when cold applications were made to head, or at the prick of hypodermic-needle.

The most constant and, in fact, only alarming symptom from beginning to end, was the delirium. This continued to increase up to 5 A.M., when there was a slight amelioration, and he had a little rest, though no sleep. After this the delirium grew less and less, and consciousness slowly returned, and at

9 A.M. there was no delirium, and he talked rationally and coherently.

He was given ½-gr. doses of morphine every half-hour after 1.30 A.M. until 4 A.M., or until six doses, or three grs. were taken. The only perceptible effect of the medication was the rest he obtained about 5 A.M., lasting about one hour, and possibly a further depression of respiration. At ten o'clock the next morning the patient was delirious and excited. The articulation was very rapid, but rather indistinct, and there were violent twitchings in the muscles, mostly confined to the lower extremities; the pupils were contracted. At two o'clock in the afternoon there was still wandering delirium; vomiting occurred late in the day, and it was not until late in the evening that the patient had recovered his normal condition.

817 FRANKLIN STREET.

CYNARA SCOLYMUS, OR GARDEN ARTICHOKE.

BY W. W. LANE, M.D., WILMINGTON, N. C.

THIS plant has been long known to possess tonic and diuretic properties, but has never, to my knowledge, been brought into general use as a therapeutic agent.

It is perennial, and indigenous in Southern Europe, and cultivated in our gardens throughout the Southern States as a culinary vegetable. The receptacle and fleshy leaflets of the calyx are eaten after being boiled and dressed with butter, salt, and pepper.

When young the head may be cut up and eaten raw as a salad. Many years ago an English physician recommended a tincture and extract prepared from the leaves in rheumatic, gouty, and neuralgic affections. I have been in the habit of using the remedy with success for many years for general dropsy, and particularly ascites.

My father used the same also with almost unvaried success on his plantation among his negroes, generally in old people with broken-down constitutions.

I think there is no doubt of its diuretic and tonic virtues. My formula is a saturated tincture of the leaves in gin, with wineglassful three times daily. The plant is a rich, luxurious perennial, the stalk and leaves perishing with the first severe frost of winter, and putting up again from the root in the spring. It may be propagated from the seed or root. Either may be readily obtained from Charleston, where it is always a market vegetable.

Having seen no notice of this plant among the new remedies, I therefore desire to introduce it to the attention of the profession, with the sincere conviction that it will be a valuable addition to our therapeutic agents.

ANTIPYRIN IN THE FIRST STAGES OF LABOR.

We have already alluded to the fact that antipyrin is claimed during the first stages of labor to render the pains less severe, while at the same time not interfering with the progress of labor. Although these claims have not been universally admitted, and we have referred to papers in which the claim is made that it is entirely negative in its action in this respect, some results published by DR. J. O. VAN WINKLE in the *New York Medical Journal* for January 5, 1889, go far to substantiate them. He refers to several cases in which antipyrin was employed. The first dose was given when the os was about one-third dilated, except in cases where the pains were very severe from the outset, when it was ordered earlier. Antipyrin, gr. xv, and spt. ammonia, xxx drops, were administered every two hours during the first stage for three doses. The temperature and pulse were noted at the time the first dose was administered, and every hour thereafter until dilatation was complete. In almost every instance the patient said she felt greatly relieved, and this was evident from her behavior. In some cases the patient would fall asleep for an hour or so after the first or second dose. Incidentally it was noticed that the temperature fell from half a degree to a degree and a half Fahrenheit. The pulse became somewhat more frequent and the respiration slightly increased. Occasionally, if the pulse was rather rapid before administering the drug, it decreased in frequency. From statistics as to the duration of labor in cases where it was not employed, and where it was employed, it would seem that antipyrin does not increase the duration of labor, but, on the contrary, tends to lessen the first stage on an average of about half an hour, while the second stage remains practically the same, and in no case was there any injury done the mother or child. The author claims that antipyrin very materially lessens the severity of the pains during the first stage of labor, and has never given rise to any alarming symptoms, this immunity doubtless being due to the fact that in its administration it was always combined with a stimulant.

The Therapeutic Gazette

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Leading Articles.

TREATMENT OF POTT'S DISEASE AND VERTEBRAL FRACTURES.

AT his recent clinics in the University Hospital, Dr. H. C. Wood suggested and exemplified a novel method of carrying out an old indication in the treatment of injuries of the vertebral column, which seems to us to have so much of promise as to be worthy of extended trial by the profession. Many years ago, even before the well-known memoir of the late Professor J. K. Mitchell, of the Jefferson Medical College, with its numerous quaint illustrations, members of the profession recognized that the great indication in the treatment of Pott's disease is extension and removal of the superimposed weight from the diseased vertebra. Various devices for meeting this indication of extension have been from time to time suggested, and the value of the plaster jacket as a means of making permanent the temporary extension gained by hanging up a patient is universally recognized. The effectiveness of this jacket depends upon the fact that the general shape of the human body is that of two opposed cones, which are placed in such a position that the base of one is the shoulders and that of the other the pelvis.

Dr. Wood's suggestion consists in using the upper cone of the body as the basis for support. In other words, the plaster jacket is made with loops over the shoulder, and by means of the ordinary tripod, Mitchell's chair, a properly constructed wheel-crutch, or other device suited to the individual needs, the patient is suspended in the jacket. Dr. Wood showed in his clinic that an upward pull upon the jacket of eighty pounds did not disturb its position, even when the pulling had steadily been maintained for several hours, and that the pressure was uniformly spread over the surface, so that no pain or discomfort was caused.

In order to make the extension as complete as possible, it has been found advisable to add to the jacket an ordinary head-strap, so that when the patient is supported there is some pull upon the head as well as upon the jacket, care being exercised not to draw up the head sufficiently to cause discomfort.

In a case of a man suffering from syphilitic caries in the middle dorsal region, the results of the treatment have been very brilliant. At the first clinic the paraplegia was so nearly complete that the patient could not cross his legs when lying in bed for one week; at the second clinic, after treatment by the jacket, he was able to walk by simply aiding himself with some slight support of the hands. At the same time there was great relief of pain in the back and great increase of the bodily comfort. Dr. Wood, in his last clinic, further suggested the advisability of frequently changing the spinal jacket and putting it on each time after the man had been hung in the old jacket several hours, so as to get a progressively increased extension, and to hold such extension as obtained. In this way it was thought that in long-continued cases the spinal deformity might be reduced to a minimum.

A further use of the method was suggested in the treatment of fracture of the vertebral column. By a long-continued suspension of the body, there would be a chance of more or less rectification of the line of the vertebra, and by elevating the head of the bed in which the patient lies, and fastening the jacket to the head-board, a perpetual extension could be maintained, which would continuously drag upon the spinal muscles and the displaced

fractured ends of the bone, and by bringing back normal relations prevent degeneration of the spinal cord. When in any such case there is reason to believe that there has been a large injury of the spinal membranes, Dr. Wood advised an immediate operation and removal of clots, and then placing the patient in the extension apparatus. Dr. Wood further stated that in the nervous clinic at the University Hospital cases of the fractures of the vertebra are very frequent; but invariably they are of such old date that no relief can be provided. The method of suspension was tried in a man in which the injury had occurred about seven weeks before, but no yielding of the bones was apparent and no relief was obtained. It was also noted that the prolonged inclined position was well borne by the patient, excepting that the circulation of feet from lack of tone in the vessels became excessively bad, resulting in intense congestion and great swelling, and even much dropsical effusion.

Several methods of making the loops in the spinal jacket have been tried, but the one which was first suggested has proved most satisfactory. It is as follows:

After the first layer of the jacket is upon the patient, a piece of webbing, linen bandage, or other strong material, well wet, has one end applied to the lower edge of the jacket, in front and to one side. The webbing or bandage is then carried up over the shoulders, upon which it rests very loosely, and brought back of the jacket to the lower edge. A smaller bandage is then put upon the opposite side of the jacket; then the external layers of the jacket are put in place. In this way the strips which are used for the shoulder-loops are so incorporated with the jacket that they cannot be pulled out; at the same time there is no tendency for the jacket to be broken or crumpled up when the extension is applied.

If from tenderness of the projecting vertebra, or from the presence of a wound, surgical or otherwise, it is desired either to avoid pressure upon the vertebra, or to have access to the affected part, all that is necessary is to cut an opening in the jacket immediately over the diseased portion of the body, care being taken that this opening shall not be so large as to interfere with the strength of the jacket.

THE CHEMISTRY AND PHARMACOLOGY OF THE NITRITES.

WITH the exception of nitroglycerin, which, in its action, is probably to be included in the nitrite series, sweet spirits of nitre and the nitrite of amyl are the only members of this group which are officinal in the United States. The physiological action of the nitrites has been tolerably well determined as characterized by reduction in blood-pressure, dilatation of the arteries, acceleration of the pulse, and the formation of methæmoglobin; the action of the nitrites of potassium and sodium is likewise well established. Little is known as to the effect produced by the union of the nitrite group with the different organic radicals; and even in the case of sweet spirits of nitre it has been argued that its efficacy does not depend upon the ethyl nitrite which it contains, but on the aldehyde or some other constituent. Evidently the only way in which this matter could be settled would be through experiments conducted with a pure solution of ethyl nitrite. This research has formed part of an elaborate series of studies conducted in the research laboratory of the Pharmaceutical Society of Great Britain by a number of prominent investigators, who have published their results in the *Pharmaceutical Journal and Transactions* for December 22, 1888. Professor Dunstan and Mr. T. S. Dymond report a method of preparing the pure nitrite by the reaction of dilute sulphuric acid with sodium nitrite and alcohol at a low temperature, the resulting product being a perfectly pure ethyl nitrite, and sufficiently stable for general use.

The comparison between the action of the officinal spirits of nitrous ether and the pure nitrite of ethyl was undertaken by Professor Leech, who, however, has been unable to discover any difference between the activity of the freshly-prepared spirit and that of the solution of pure nitrite of ethyl: nor did they differ, as far as he has been able to ascertain, in their action on the kidneys.

Professor Leech has likewise tested the therapeutic value of this preparation in cases characterized by vascular contraction, and difficulty of breathing from bronchial spasm, and finds that both preparations have an equally marked value in preventing the attacks of angina pectoris, and in dilating the arterioles in relieving an overloaded heart. The spirit of nitrous ether is frequently poor

in nitrite, especially after the preparation has been kept for some time, and then it of course loses its value as a medicine. The solution of the nitrite of ethyl in alcohol and glycerin seems to be perfectly stable, the only possible drawback to its use being the large amount of alcohol which is required to administer such a dose as two minims of the nitrite. The adoption of a constant solution of the nitrite of ethyl, as a substitute for the inconstant sweet spirits of nitre, is evidently called for.

The action of the different constituents of the nitrite of amyl furnish the material of the other investigations. Professor Dunstan and Messrs. E. J. Woolley and W. Lloyd Williams have found that amyl nitrite nearly always contains iso-butyl nitrite and two other amyl nitrites, which they describe as α- and β-amyl nitrite, while one specimen contained also ethyl and propyl nitrites. Iso-butyl nitrite has been but little studied. It is a pale yellowish liquid, having a somewhat fragrant odor, and causing, when inhaled, flushing of the face and other disturbances. It is extremely unstable, and when administered to animals has been found by Professor Cash to cause rapid fall of blood-pressure, an acceleration of the pulse, and marked respiratory paralysis. The source of the α amyl and β-amyl nitrites, together with the other impurities often found in nitrite of amyl, is found in the fusel oil which is used in the manufacture of this preparation. Of all those constituents of nitrite of amyl, the α-amyl nitrite is the only one which has as yet been obtained pure, and it is at present under investigation by Professor Cash, who has not yet, however, published any definite conclusion as to its action: it seems, however, that there is considerable difference in the physiological action between the pure nitrites and the mixture of the two amyl nitrites. This alone would serve to account for the variability of the results which have been noted to follow the use in medicine of the officinal amyl nitrite.

In order to ascertain whether the substances other than nitrites which are contained in officinal amyl nitrite possess any therapeutic value, Dr. T. Lauder Brunton and Mr. T. Jessop Bokenham have compared the action of the pharmacopœal liquid with that of the two pure amyl nitrites, and have found that there is a marked difference in their action, they having found that preparations containing iso-butyl nitrite are much more active than the pure amyl nitrite. The unreliability, or, perhaps better, the failure sometimes of preparations of nitrite of amyl to relieve angina pectoris, may be attributed to the loss of the active constituents, as nitrites that are more than a few days old have failed to remove pain; and therefore many cases where amyl nitrite has failed in such a case to give relief are not to be attributed to the inefficacy of the remedy, but to the absence of the active agent. It seems that it is actually the iso-amyl nitrate to which the properties of the officinal nitrite are due.

These papers serve to show, in the first place, that the officinal nitrite of amyl and the officinal sweet spirits of nitre are remedies which are inconstant in their composition. They show that the active principle of sweet spirits of nitre is the ethyl nitrite which it contains, and the preparation which is at present the officinal one should be discarded and a definite solution of the ethyl nitrite should be substituted for it. The officinal amyl nitrite has been shown to contain varying constituents of the different members of the nitrite group, and these different constituents have different degrees of activity. While this investigation has not been carried as far as might be desired, it has, nevertheless, demonstrated that iso-amyl nitrite is more active, or rather more prompt in its action, than the rest of these bodies. When it has been shown which is best adapted to therapeutic use, and after a satisfactory and practical method has been devised for its preparation, it is then evident that such a preparation should replace the variable officinal nitrite of amyl.

SULPHONAL.

SULPHONAL appears to be rapidly entering the category of drugs which, enthusiastically recommended at first, gradually develop unfavorable actions or unreliability in the results produced. In our previous issue we alluded to several unfavorable complications, and to one case of marked toxic symptoms which followed its employment. In the *Wiener Medizinische Blätter* for December 13, 1888, Dr. Mathes, one of the most enthusiastic introducers of this drug, publishes his further experience concerning its use in the clinic of Professor Ziemssen in Munich. The cases in which this drug was employed were twenty-seven in number, with ninety-nine single doses, usually amounting

to from 15 to 30 grains. Of the twenty seven cases, hypnotic effects were produced in twenty-one cases of the most varied morbid processes, although in all severe diseases, such as pernicious anæmia, phthisis with distressing cough, typhoid fever, and delirium tremens, hypnotic results were never obtained. On the other hand, in cases of heart-disease, with or without disturbance of compensation in power, nervous insomnia, in spinal meningitis, in progressive paralysis, and trigeminal and intercostal neuralgia, the effects have been claimed to have been entirely satisfactory. Nevertheless, after-effects were noted in the majority of cases, consisting of a feeling of fatigue and depression, ringing in the ears, headache, and sometimes vertigo. These symptoms are usually stated to have disappeared in the course of the following day. It was noted that these disagreeable after-effects were more marked when the sleep produced by the sulphonal was accidentally interrupted. If the patients were allowed to sleep until they awoke spontaneously, and then allowed to lie undisturbed for some time, distressing after-effects usually did not appear. Further observations show that no special relation exists between the amount of dose and the severity of the after-effects. Thus, in one case 75 grains were administered without producing any effect, while in another instance one-tenth of this dose produced most severe symptoms. No accustoming to the drug was noted; in fact, it is even stated that after continued use of sulphonal half the usual dose will serve to produce the desired effect. The author concludes that while sulphonal is a useful hypnotic, it is by no means a thoroughly reliable one, but he still prefers it to other hypnotics on account of its freedom from odor and taste, and the absence of toxic action on the vital organs. The dose must be tested on each individual, though in the majority of cases 15 grains will be sufficient. He advises that it shall be given at least an hour before sleep is desired.

Professor Ott (*Prag. Med. Wochenschrift*, No. 40, 1888) has had in general a somewhat more favorable experience with sulphonal, though he also has met with cases in which it failed to produce the desired effect, even in doses of 45 grains; and he also reports cases where vomiting and faintness were produced by the internal administration of 45 grains. Nevertheless, he likewise regards sulphonal as an important addition to our list of hypnotics. His experience, in connection with others we have alluded to, show that the drug is not entirely without danger, and that its employment must be commenced with small doses, since certain individuals are more susceptible to its use than others, and that it cannot be looked upon as an invariable hypnotic.

Dr. Schotten also relates in the *Therapeutische Monatshefte* for December, 1888, the case of a woman, 45 years of age, who had been in the habit of taking 45 grains of chloral nightly for insomnia, who received in the evening, at half-past eight, 30 grains of sulphonal. No satisfactory sleep was obtained, and on the following morning she complained of great fatigue. On the second night the same dose was repeated at eight o'clock, and still without effect. On the third evening, 45 grains of sulphonal were administered. This time sleep was produced, but on the following morning she complained of great fatigue, inclination to sleep, sinking of the upper eyelids, slow, indistinct speech, and difficulty of moving the tongue. At the same time there was severe headache, bitter taste in the mouth, and loss of appetite. This condition of affairs lasted for four days, although no further administration of chloral or sulphonal was given; and while there was the constant sleepiness in the day-time, yet the rest at night was very much broken. Four days after the last dose of sulphonal, an eruption, which closely resembled measles, appeared, and which, commencing on the head, finally covered the entire body. This was accompanied by heat and burning of the skin, but no implication of the mucous membranes. With the appearance of this exanthem the other symptoms rapidly disappeared, and although two days later the eruption commenced to fade, traces of it lasted for over two weeks. The remarkable points in this report are, that, in the first place, sulphonal should be given for three days without producing sleep, and yet the third day should lead to the appearance of severe subjective and objective symptoms, lasting for four days after its discontinuance; in the second place, that an eruption should have appeared four days after the last dose of the drug. This prolonged action of sulphonal is without doubt to be attributed to its great insolubility.

Numerous investigations have recently been made as to the chemical changes produced by sulphonal, especially in its relation to its influence on the elimination of nitrogen and the changes which sulphonal undergoes in the economy. Dr. W. J. Smith has found

that the excretion of nitrogen, and, as a consequence, the destruction of albuminous material in the organism, is not influenced by the administration of sulphonal, while Kast (*Therapeutische Monatshefte*, November, 1888), from an experimental investigation of the subject, has determined that in moderate doses sulphonal is decomposed into soluble organic sulphur compounds. It therefore differs in this respect from the large number of allied substances, the other disulphones, which pass through the organism without undergoing change. He further finds that the excretion of sulphuric acid in the form of sulphates in the urine is not increased by the administration of sulphonal, a point which would appear to indicate that the organic compounds formed from sulphonal are characterized by great stability. Kast likewise confirms Cremer and Smith as to the fact that sulphonal is without any influence on the nutritive process in the economy, and that it does not disturb digestion in the stomach and intestine.

A NOVEL TREATMENT FOR HEMORRHAGE FROM THE LUNGS.

THERE is no fact better established in physiological therapeutics than the power of the alkaloid atropine to contract the capillaries. Ergotin has been long used for this purpose in the treatment of hemorrhage from the lungs, so that it seems rather odd that no one has assayed the use of atropine, at least we cannot remember to have read of the alkaloid being employed for the purpose of checking a hemorrhage. At the meeting of the Medical Society of Victoria, on the 14th of last November, Dr. R. A. Stirling narrated a case of profuse bleeding from the apex of the left lung, in which hypodermic injections of ergotin and other commonly used remedial measures had failed to check the hemorrhage, which was sufficiently severe to threaten immediate death by suffocation, but in which the hypodermic injection of $\frac{1}{150}$ grain of atropine at once controlled the bleeding. During twenty-four hours the injections were repeated at intervals of every six hours; then, thinking that the stoppage might have been accidental, the doctor omitted the treatment for twelve hours, with the result of a fresh and severe attack, which was at once controlled by the renewal of the treatment.

Reports on Therapeutic Progress.

DIETETIC TREATMENT OF CHRONIC BRIGHT'S DISEASE.

The proper dietetic treatment of chronic Bright's disease of the kidney is a subject of certainly as much practical importance as its medical management, or the rules pertaining to clothing and climate. It is, therefore, a somewhat remarkable fact that but little, relatively, has been written in regard to it, at least of an accurate kind. Especially is this statement true for the past few years, when so many treatises, articles, and discussions have taken hold of the disease in question, from many different aspects. The pure pathologist has, by means of the microscope, unravelled much that was previously obscure; the physiologist has dealt extensively with the sphygmograph and the effects of increased blood-pressure; and the clinician has discussed fully matters of heredity, etiology, and symptoms, and facts pertaining to urinary analysis, in which he has also been aided by the chemist. Remedial treatment, indeed, has been much studied, but particularly with reference to drugs, to venesection, to clothing, and to climate changes. Meanwhile the subject of dietetic treatment has only been touched upon, as it were, by many writers.

In the *Medical Record* for January 5, 1889, DR. BEVERLEY ROBINSON publishes an important contribution to this phase of the treatment of Bright's disease. He shows that the indications for proper dietetic treatment in chronic Bright's disease vary somewhat, of course, with the form and stage of the renal degeneration, as well as with the nature of the secondary complications which may be present. In each case it is of practical importance to discover, if possible, the probable cause of the actual disease, and the dietetic treatment should be directed more or less in accordance with the discovery made. Thus, if excessive eating or drinking be the obvious exciting cause, considerable limitations as to food and drink seem rational and well ordered. If gout be manifestly present, in an hereditary or acquired form, there are certain aliments and beverages that should be specially prohibited. The three forms of Bright's disease which are generally recognized are,—

1. Chronic parenchymatous nephritis (the large kidney without waxy degeneration).

2. Lardaceous disease of the kidney (waxy kidney).

3. Interstitial nephritis (the small granular kidney).

Dr. Robinson points out that the dietetic treatment of these three different forms of Bright's disease varies, and he considers the methods of treatment of each in detail. All dietary rules pertain to food, drink, and the use of stimulants. In chronic parenchymatous nephritis, the best diet is generally recognized to be an exclusive milk diet.

The reasons given for this preference and which appear to me important, may be enumerated as follows: 1. Milk is easily assimilated, and is, therefore, well adapted to a disease in which digestive disturbances are almost the invariable rule. These disturbances are, generally, as we know, of the nature of dyspepsia, nausea, vomiting, epigastric pains, etc. 2. If a suitable amount of milk be taken daily, it provides sufficient nutriment for the needs and proper support of the economy. 3. An exclusive milk diet forms less urea in the blood than any other form of alimentation. 4. Milk furnishes a large quantity of fluid to flush out the kidneys with, always supposing it is taken at short intervals and in fairly large quantities each time. In this way it increases urinary excretion by continued excessive pressure in the arterial system, and thus helps the dropsy to disappear by degrees.

The objections which are, or may be urged against an exclusive milk diet are: First, it is not tolerated by all patients. Some persons soon tire of it, or get a profound, unconquerable disgust for it. There are a few individuals, also, in whom an idiosyncrasy has much to do with this distaste, and try as we may to get them to take milk in any useful quantity, we are finally obliged to abandon the effort in sheer despair of success. In either of these two contingencies, we are obliged to recur to the use of broths (chicken and veal), beef-tea, light farinaceous food, and other diluents than milk.

As regards beverages, the best is unquestionably pure water, and especially pure spring water. The first great thing to accomplish is, at all events, to have these patients drink much pure water, up to several pints a day, and yet not upset an already weak digestion in doing it. The use of water abundantly as a diuretic in renal disease does not antagonize the principle of giving the kidney little or moderate work to do, as it is a physiological diluent, and does not occasion any irritation of the kidneys. Some other diuretics, among which we may at times place digitalis, are prone to induce this untoward effect, either directly or by increasing heart-action, and contracting the small renal arteries. This is not true, however, of mild alkaline water, soda-water, or cream of tartar solution with lemon in it (Imperial drink). By these different means a marked flow of urine is obtained and the kidneys are kept continuously flushed, so that the masses of degenerated epithelium which tend to clog the tubes are gotten rid of. In this manner any remaining congestion of the gland will be relieved by secretion, and the system will be cleared of impurities which previously had been retained. By the passage of a large quantity of fluid through the kidneys we also reduce to a minimum (dilute?) that nitrogenous excess which finds its way out through these organs, and gives rise to many sources of irritation. If at the same time we cut off the materials of urea and uric acid, we are doing the best we can accomplish (Dickinson).

Tolerance of milk, however, when pure milk is objected to, may often be obtained if we mix it in certain variable proportions with lime-water, carbonic water, Vichy, etc., or give it in the form of peptonized milk or koumyss. Whenever milk is well supported by the stomach it may be taken either skimmed or unskimmed,—that is to say, with or without the cream. Unskimmed milk is advantageous, says George Johnson, because it prevents constipation. It is desirable, according to Tyson, because its nitrogenous principle, the casein, is present in a proportionally small amount as compared with skimmed milk. On the other hand, the stomach is often intolerant of rich milk, and the fatty elements in the cream are apt to occasion numerous dyspeptic symptoms, such as headache, heartburn, diarrhœa, etc. Under the circumstances the milk had better be skimmed rather than abandon it as the main article of diet. Even though we are obliged to do this, or to adopt many different methods to make milk tolerable to irritable stomachs, we should try all means which offer any chances of success before abandoning it altogether. Sufferers from chronic Bright's disease are so frequently affected with gastric symptoms which may prove both obstinate and distressing, that it will scarcely do to give up milk diet without a prolonged struggle to avoid it if possible. The probabilities are that many dyspeptic symptoms are occasioned by vicarious elimination, through the mucous membrane of the stomach, of impurities which normally are secreted by the kidneys. This is proven by the fact that the gastric secretions are at times mingled with the products

of decomposed urea. Of course, when this is the case, relief should be sought, partly at least, in suitable diet, and iced milk in small quantity can occasionally alone be taken. If this fail us, nutritive enemata must be resorted to in order to sustain the patient until incessant vomiting be stopped. When taken, milk may be either warm or cold, as best suits the patient. It is usually found that if great irritability of the stomach be present, it is more acceptable cold, in small quantities and at short intervals. If it form the exclusive diet, it must be taken in fixed quantities and at specified hours. From a few ounces to half a pint, or one pint, may be taken every two or three hours by an adult. From two and a half to four quarts in the twenty-four hours are sufficient to prevent bodily loss and to keep its condition about stationary.

In children affected with chronic Bright's disease milk diet acts extremely well, and while they are upon it there is no need for them to have any other food or drink. Of course they will take less milk than adults in proportion to their ages. Clinically there is evidence to show that exclusive milk diet (or nearly so) reduces notably the quantity of albumen excreted by the kidneys.

In relation to the milk diet, experiments have shown that to produce a diminution of albumen in Bright's disease milk must be given, not to supplement, but to replace the articles of ordinary diet. The author concludes that the effect of the milk diet is not merely apparent and due to albumen being more than ordinarily diluted, for ordinary diet, with an equal quantity of water, did not produce the same result. If, however, while on the milk diet symptoms of general anæmia, exhaustion, etc., become manifest, and especially if the quantity of albumen in the urine be small, the exclusive milk diet should be supplemented by a due proportion of vegetable food. Finally, even this diet may become objectionable, as it obliges the stomach and intestines to perform more work than they can properly accomplish, and whenever this condition is tolerably evident a moderate amount of boiled or roast meat should be allowed daily. As a rule, all stimulants are injurious in the dietetic treatment of chronic parenchymatous nephritis. In any form alcohol increases the work of the kidneys, augments the quantity of urea in the blood, and promotes increased excretion of albumen. Claret and the light French and German wines are, perhaps, the least objectionable. Gin, or whiskey much diluted, are occasionally of value as diuretics, though even a small quantity of certain wines, like Moselle, Madeira, or Champagne, will increase immediately and considerably the quantity of albumen excreted. Madeira in this respect is considered as the most injurious.

In regard to the question of using alcohol, it should be continually borne in mind that its consumption, by the extra work it imposes on the kidneys, is opposed to the principle of lessening as much as possible the labor of the altered gland-tissue. It should also be remembered, particularly among the lower classes, that excess in taking alcohol has been believed by many distinguished observers to be one of the most frequent causes of albuminuria. If this view be only at times correct, it may be inferred in certain cases that a moderate employment of alcohol may tend to "perpetuate and aggravate" the disease when it is obviously due to other causes. It is further proven by clinical experience that alcoholic stimulants produce greater and more pernicious effects when there are considerable renal changes than would result from an equal quantity given when the kidneys are in a normal condition. Despite all these objections, conditions may arise when alcoholic stimulants are imperatively called for. Such instances are those which occur whenever great exhaustion is present, as by reason of blood-losses from albuminuria; and in instances in which there is profound anæmia, particularly of the brain. This condition is often, as we know, the accompaniment of threatened uræmic symptoms,—viz., convulsions, dyspnœa, etc., when the economy is literally poisoned by retained urinary excreta. Under these circumstances alcoholic stimulants are needed, and may be given as freely as the occasion seems to require. In some instances, no doubt, the uræmic attack may be aborted, owing to the fact that more blood is sent to the brain, which is deprived of it, and the heart, which is beating rapidly and feebly, is strengthened, and great temporary relief is thus afforded. In these cases we should scarcely look for much help from malt liquors or wines, but must place our reliance upon the strongest alcoholic liquors,—viz., brandy or whiskey.

The dietetic treatment of lardaceous disease of the kidney depends somewhat upon its cause, if it continues to be present. If it be phthisis, abundant and nourishing food should be given, of which milk and cream should form a large portion, but meat should

not in these cases be denied, while alcohol should be allowed in moderate quantities, and good wine is often a great boon to the sufferer. In this manner the loss the general system suffers from profuse suppuration is in some degree compensated. From a theoretical stand-point, a good beef extract is useful, as an addition to daily diet, by reason of the saline constituents of beef which it supplies in a concentrated form. When the disease has disappeared which has been the cause of the renal changes, the dietetic regimen should not differ materially from that which I have counselled for parenchymatous nephritis.

The dietetic treatment of interstitial nephritis should have mainly in view,—1. To maintain the integrity of the blood by preventing the accumulation of urea and allied compounds. 2. To compensate the loss by albuminuria.

As regards the food, we should be particularly careful in its choice, for the reason that the patient's appetite is often good, and nutrition may be kept up without causing unnecessary risks. It is all-important to bear in mind that the urea which accumulates in the blood is largely formed from nitrogenous food, and is increased in proportion to the amount of this kind of food taken. Of course the more urea accumulated, the more the kidneys are called upon to work to eliminate the excess through their excretion. While it is neither possible nor desirable to prohibit all nitrogenous food, yet it is evident the amount allowed should be very moderate. Milk and cream should be supplied abundantly, and the other necessary elements of food should be obtained from the vegetable kingdom, it being especially advantageous to dilute milk with Vichy water. Alcoholic stimulants should be avoided as far as possible. Malt liquors, if the case be a gouty complication, should be strictly prohibited. The light wines may occasionally be permitted, but then only sparingly. In the treatment of uræmia it is often indicated, however, to give the stronger alcoholic stimulants promptly. Of these, gin and whiskey are perhaps the least injurious.

CHOREA AND ITS RELATION TO RHEUMATISM.

At the meeting of the Royal Medical and Chirurgical Society, January 8, 1889, DR. W. P. HERRINGHAM read a communication on eighty cases of chorea, with antecedents, family history, state of the heart, and subsequent history, of which the following is an abstract (*Lancet*, January 12, 1889):

Antecedents.—Acute rheumatism preceded the attack in nineteen cases, immediately in four, at some interval in fifteen. It accompanied the chorea in two cases. Pains in the joints preceded the attack in fifteen cases, and accompanied it in one case. The total number of cases in which rheumatism of some sort could be traced was thirty-seven. Injury, shock, or violent outburst of emotion preceded the attack in six cases, the interval never being greater than two days. Hard mental work or worry were found in twenty cases. These influences were not mutually exclusive, since all those classed under injury, shock, or emotion could alone be considered as exciting, the others only predisposing, causes. In twenty-five cases none of them could be traced, and of these fourteen were first attacks. Nearly all the patients were delicate. Headaches and indigestion were the most common complaints.

Family History (calculated from parents, brothers, and sisters only).—Rheumatic fever had occurred in twenty-five out of seventy-five families, seventeen of which belonged to thirty-four patients of the rheumatic classes, and the remaining eight to forty-one in whom there was no history of rheumatism. Chorea had occurred in twelve families, nine of which were also rheumatic.

State of the Heart (throughout).—Natural in ten; uncertain (*i.e.*, doubtful endocarditis) in twenty-five; certainly diseased in twenty. Signs of disease developed during observation in eleven cases, and signs which were at first present vanished during observation in four. Thirty-seven cases were seen again, usually at an interval of two years or over. For the most part they presented the same state as before. Of the twenty-five doubtful cases, two had become healthy, seven appeared certainly diseased. Of the eleven cases which developed signs during the attack of chorea, five were re-examined, and of these two were natural, while three gave good evidence of disease. This last was important as tending to show direct influence of chorea upon the heart. The following conclusions were drawn: 1. That a large number of choreic patients were liable to rheumatism. 2. That choreic patents were nearly always of a delicate constitution. 3. That chorea was sometimes directly caused by emotion. 4. That chorea might cause permanent heart-disease. 5. That it also gave rise to signs of heart-disease which were not permanent.

This paper was followed by one from the pen of Dr. Archibald E. Garrod, on the "Relation of Chorea to Rheumatism," with observations on eighty cases of chorea. The conclusions arrived at in this paper were based upon eighty consecutive cases of chorea, sixty-one of the patients being females, and only nineteen males. Forty-nine were suffering from first attacks. The average age of the female patients was considerably higher than that of the males. There was a history of rheumatic fever in the near relatives of twenty-six patients, of rheumatism with swollen joints in those of three, and of rheumatism in three more, making a total of thirty-two, or forty per cent., with rheumatic family histories. It was pointed out that the tendency to chorea was far more marked in some rheumatic families than in others, and examples were quoted illustrating this point. The total number of cases in which there was a personal history of rheumatic manifestations other than endocarditis was thirty-six, or forty-five per cent. In fifteen of these there was a definite personal history of rheumatic fever, in nine of rheumatism with swollen joints, in one of joint-pains, confining the patient to bed, and in nine of joint-pains only. One patient had nodules, but no arthritis, and one had acute pericarditis. It was shown that the same patient sometimes had an attack of chorea with joint-pains only, and a later attack with well-marked rheumatic fever. Evidence was brought forward to show that some cases in which there was no family history of rheumatism, and no personal history of joint-pains, were, nevertheless of rheumatic origin, cases being quoted of rheumatic patients who had previously suffered from chorea, of the development of erythema nodosum and arthritis in the course of apparently non-rheumatic chorea, of chorea with endocarditis and nodules without joint-pains, and of the association of acute pericarditis with chorea. In fifteen cases the onset was ascribed to fright, but in some instances inquiry showed that the fright followed the onset of the chorea. A definite murmur was heard in forty-five cases, or 56.25 per cent., and in six others the first sound was murmurish. The percentage of murmurs was naturally highest among those with personal histories of rheumatism, but was lowest among those with family history only. In some instances the murmurs developed under observation. The opinion was expressed that the endocarditis of chorea was probably always of rheumatic origin, but that we had no evidence to show that all chorea was of rheumatic origin, a considerable number of cases being probably due to emotional and other causes.

Dr. Cheadle felt surprised that Dr. Herringham had limited his inquiries in the subject of rheumatism to the presence of arthritis. Statistics concerning rheumatism compiled from the consideration of that symptom alone must be inadequate. In many cases the arthritis was extremely slight, or it followed the fever. He related the case of a child admitted under his care at St. Mary's Hospital with chorea; there was no family or personal history of rheumatic fever, no cardiac bruit, and no nodules. When the child had been in hospital four days, transient swelling of the right wrist occurred, followed by an even slighter attack in the left wrist. Many such cases among the poor were frequently overlooked. The presence of subcutaneous nodules, of peri- and endocarditis and erythema occurring together, afforded good cumulative evidence of rheumatism. Fright was an equally effective cause in the rheumatic and non-rheumatic cases. He related two cases in which chorea had been cured, but mental emotion brought on an acute second attack in each. It was a matter of common observation that rheumatic children were delicate, but it was an open question whether the nervous instability was produced by the rheumatism, or whether they, so to speak, ran together. The report of the Collective Investigation Committee of the British Medical Association showed that headaches were common in this affection. He believed that a much larger proportion of cases of chorea was rheumatic than was generally supposed, and the absence of a history of arthritis was not to be taken as proof that the case was of non-rheumatic origin.

Dr. A. E. Sansom said that his experience led him to believe that there was a fright-chorea dissociated from rheumatism. He was prepared at the same time to admit that the tendencies to rheumatism were difficult to define, and cases apparently non-rheumatic often became undoubtedly rheumatic later on. He had met with some cases, and he detailed one, in which fright was the determining cause and rheumatism could be excluded altogether. Speculating on the relations between fright-chorea and endocarditis, he thought that the excessive cardiac action which followed the preliminary blanching of terror, might be a factor in the causation of chorea, either directly or indirectly; the vio-

lent palpitation occurring in a child might, he thought, set up inflammation of the delicate valve-curtains. Two forms of endocarditis should be recognized in association with chorea,—the ordinary rheumatic valve thickening, and a "beading" of the valve-cusps with small papillary elevations much resembling the lesions produced artificially, and described at the last meeting of the British Medical Association.

Dr. Sturges felt sure that there was a real relation between chorea and rheumatism, but was doubtful as to its amount and extent; he thought there was a tendency to exaggerate this relationship. Dr. Herringham had only been able to trace a direct and immediate connection between rheumatism and chorea in four cases out of eighty, and it was often necessary to seek far in order to find the rheumatic element. He contrasted this with fright, the chorea following which came on usually without an interval. Great divergence of opinion existed on the subject abroad; in Germany rheumatism was regarded as a small and trivial element in chorea, whereas the French thought that chorea was a mere manifestation of rheumatism. Osler, of the United States, had put together many cases, and had found practically no rheumatic proclivity at all. Discussing the joint-pains in connection with chorea, they were sometimes rheumatic and sometimes not, and he felt there must be some deeper relation between chorea and the joint affection. With regard to treatment, he divided chorea into two stages,—the first emotional and often overlooked, the second motional and obvious. If taken early during the first stage, appropriate treatment could arrest the disease.

Dr. Barnes alluded especially to the important relationship existing between chorea and pregnancy, and related a case where a child had chorea and was cured, but, in later years, becoming pregnant, the chorea returned with increased severity. The pregnant state was one of high nervous tension and strong emotion, and this, perhaps, explained the outbreak. Chorea, if evoked by pregnancy, often tended to insanity.

Dr. Stephen Mackenzie thought that the evidence lately had become increasingly strong that rheumatism played a great part in the production of chorea. He thought that the differences noticed in the valves by Dr. Sansom were explicable by the relative age of the lesions, the small beaded vegetations being much more recent. He referred to the gravity of chorea when occurring in pregnancy, but thought that some factor other than gestation must be at work to produce it.

Dr. Robert J. Lee regarded chorea as a symptom rather than a disease; though it might coexist with rheumatism, yet there was no evidence to show that the two bore to each other any other relation of cause and effect. He did not think pregnancy could be looked upon as a cause of chorea, for the latter occurred so extremely rarely as a complication. Emotional influences, he felt sure, played a considerable part in its production.

Dr. Herringham, in reply, said he had restricted his inquiries to arthritis, because the evidence of other more equivocal data would be rejected by the sceptical. He could only look upon rheumatism as a collection of symptoms, and, in fact, all other diseases could be included in the same definition.

Dr. Garrod, in reply, said it would be interesting if Dr. Sansom could adduce cases where endocarditis alone had followed fright. A good deal of the discussion had turned upon what was really meant by rheumatism; he himself regarded it as a general disease, of which arthritis was but one manifestation.

A NEW METHOD OF TREATING GONORRHŒA.

During the last few years considerable progress has been made on the subject of gonorrhœa. The discovery of the specific cause—the gonococcus of Neisser—has thrown a great deal of light upon the nature of the disease. It has made it possible to separate the same from other similar, yet vastly different, processes, and we are enabled to test the multitude of remedies used heretofore by their direct action against those microbes, etc. On the other hand, the development of endoscopical methods has opened a wide field for research, more especially in regard to the chronic forms of gonorrhœa, and our ways and means to treat these conditions have been materially improved.

Unfortunately, however, the treatment of the acute stage remains as unsatisfactory as ever. The composition of the different fluids which are ordinarily used for injection seems to make very little difference. In the *Medical Record* for January 19, 1889, Dr. Joseph Zeisler describes a plan of treatment, the credit of which he gives to Dr. C. S. Pixley, of introducing dry powders into the male

urethra. The instrument which he has devised for accomplishing this consists of three principal parts, two of which resemble very much the original form of the urethroscope, as devised by Désormeaux, Fenger, and others,—namely, first, a canula, with a cup attached to one end; second, an obturator, to facilitate the introduction; and third, a hollow spiral, whose object is to convey the powder through the canula into the urethra. The canula has, in the present form of the instrument, a length of six inches and a diameter of about one-fourth inch (corresponding to No. 20 of the French gauge). The cup has a capacity for about two drachms of dry powder; a narrow bridge with a set-screw is attached transversely to the cup, in order to fasten the spiral in its proper position. The length of the spiral corresponds exactly to that of the canula, so as not to protrude beyond the lower end of the same when fully inserted; the upper end of the spiral is formed by a milled head, on the top of which is an arrow, indicating the direction in which the spiral should be turned. Just below the milled head is a groove, into which fits the set-screw. Below this groove, to what may be called the neck of the spiral, is attached an agitator, which, during the turning, continually moves the powder towards the spiral. The obturator, which needs no further description, transforms the canula practically into a solid, straight, urethral sound.

The instrument could, of course, be easily manufactured in different sizes, although the present (No. 20) will answer for most cases. The length of six inches will allow the introduction up to the membranous urethra only, which, in acute cases, where the inflammation has not invaded the deeper parts, will be all-sufficient. With a slight modification, increasing the length of the canula and spiral, and placing the cup under an angle, the instrument could also be adapted for the purpose of treating the deepest parts of the urethra.

Mode of Operation.—The patient is directed to evacuate his bladder perfectly; next the urethra is thoroughly washed out with a weak solution of permanganate of potassium (1 to 10,000), or some other suitable alkaline solution; this may be best done by the well-known retrojector. Now the urethra is dried as perfectly as possible by gently stripping the penis with a clean towel. The patient is then placed in a recumbent position, and the instrument, with the obturator inserted, is lubricated (best with glycerin), and gently introduced into the urethra back to the pars membranacea. The obturator is now gently withdrawn, so as to cause the least possible irritation of the mucous membrane, the spiral substituted therefor, and fastened by the set-screw into its place. The medicament is now placed into the cup, and by constant turning of the spiral in the direction indicated by the arrow, conveyed through the canula to the deep urethra. At first very little resistance to the turning of the spiral is felt; as soon as the powder begins to be deposited in the urinary channel, the operator will experience a decided resistance. The instrument may now be slowly withdrawn, and in this way the whole urethra filled with the powder. The operator can easily regulate the amount of powder he wishes to introduce. It is not possible to pack the urethra too firmly, as the instrument is in a certain measure self-regulating. The operation completed, a small quantity of the powder is placed around the meatus and the glans penis, to keep these parts as dry as possible from the ensuing discharges, and the patient directed to keep the same always covered with dry absorbent cotton.

If properly executed, the whole operation will cause very little inconvenience to the patient; by the previous use of a cocaine solution it can be made absolutely painless. The patient will, during the next few hours, naturally have a sensation of fulness; by and by, as the powder is dissolved and eliminated by a profuse watery discharge, the urethra will be emptied within four to six hours.

The number and frequency of operations will depend on the gravity of the symptoms; one application daily will usually be sufficient during the first few days; later it may be done only every second day, or even at longer intervals.

In the composition of the powder, boric acid has been adopted as the basis, to which may be added different drugs, to meet the requirements of the case. A long series of experiments will probably be necessary to finally determine what combinations may be of most value. For the present, the following suggestions may be useful: In the beginning the mildest possible powders should be used, such as pure boric acid, or, as Dr. W. E. Morgan recommends, calomel, 1 part; bismuth subcarbon., 2 parts; boric acid, 12 parts. With the decrease of inflammatory symptoms the powder can be made more astringent by an addition, in proper proportions, of alum, subnitrate of bismuth,

hydrastin, etc. Reports of the poisonous effects of boric acid after packing the vagina have lately been published; but with the comparatively small quantity of the acid used in the urethra no such result seems here possible, except in rare cases of idiosyncrasy.

While Dr. Zeisler acknowledges that this method of treatment has been too recently introduced to warrant success, yet, even on theoretical grounds, it has much to commend it. In the first place, it is based upon antiseptic principles. The inflamed and suppurating mucous membrane remains in contact with a mild yet powerful antiseptic or astringent agent for several hours in succession; this will surely appear more effective than the occasional use of an injection during a few minutes. The diseased urethra is in this way placed under nearly the same conditions as any suppurating cutaneous surface. The purulent discharge will immediately be made innocuous, and its infecting influence upon uninvaded parts will be checked.

From the actual observations made, the following experience has been gathered. It is desirable to begin the treatment as early as possible. The acute inflammation forms no contraindication against the use of the instrument. The effect of the first few powder applications is to deprive the secretion of its purulent character and to change it to a mucous fluid; a few more treatments will result in rendering the discharge only serous in character, when a mild astringent injection will terminate the course of the disease in a few days. The duration of the disease has in this way in all cases been materially shortened. Chordee, usually so troublesome, has in every case been greatly relieved. Epididymitis, cystitis, stricture, or any other complication, was not known to follow any of the cases treated in the foregoing manner. While the benefit derived from the treatment was not always equally great, there was never the least harm done by it.

MORBID CHANGES CAUSED BY ANTIPYRIN, THALLIN, AND ANTIFEBRIN.

Dr. Konstantin D. Pisemsky, of St. Petersburg ("St. Petersburg Inaugural Dissertation," 1887, p. 48; analyzed by Dr. V. Idelson, *London Medical Recorder*, December 20, 1888), has carried out in Professor N. P. Ivanovsky's laboratory three series of experiments on healthy adult rabbits and dogs, in order to study morbid changes arising in the animal system under the influence of large doses of the said three drugs, so extensively used in daily practice all over the world. The outcome of Dr. Pisemsky's researches, presenting a considerable practical interest, may be summarized as follows:

I. *Antipyrin.*—[The drug was invariably introduced under the skin,—*a*, in rabbits, either in the daily dose of .5 gramme (7½ grains), death ensuing on the sixteenth to thirty-first day; or in that of 1 gramme, the animal dying in several hours; or in that of 1.5 gramme, death taking place one and a half hours after the injection; *b*, in dogs, in the daily dose of 1 gramme, the animals dying on the fifteenth and twentieth day; or in that of 3 grammes, death occurring on the next day after a single dose.] The most prominent alterations were these: 1. Intense congestion of the brain and its meninges, with some serious effusion into the cerebral ventricles. 2. Intense congestion of the lungs, with hypostases, the organs having a bright red (as if "highly arterialized") color. 3. Dryness, and often a very considerable contraction of the spleen. 4. Congestion of the kidney, sometimes with initial inflammatory lesions. 5. Congestion of the liver, somewhat less frequent comparatively with other changes. 6. The numerical strength of red blood-corpuscles in the beginning increases, but later on sinks, the decrease possibly depending upon a progressive exhaustion of the system. 7. The body's weight steadily falls.

II. *Thallin.*—[The drug was used always hypodermically,—*a*, in rabbits, in the daily dose of .2 gramme, death ensuing on the sixteenth to twenty-eighth day; or in the dose of .4 gramme, the animal dying on the next day after the injection; *b*, in dogs, in the daily dose of ⅓ gramme, death occurring on the twenty-fifth to twenty-eighth day.] 1. Thallin displays a by far more powerful irritant action on animal tissues than antipyrin. 2. In the brain, lungs, spleen, liver, and kidneys there are detected, side by side with intense congestion, quite distinct inflammatory and degenerative changes (in initial stages). 3. The numerical strength of red blood-corpuscles at first somewhat decreases, then temporarily slightly rises, to subsequently fall steadily in a considerable degree. 4. The body's weight is diminished more rapidly and more considerably than in the case of antipyrin.

III. *Antifebrin.*—[The drug was adminis-

tered internally, through a gastric tube, to four dogs, in the daily dose of 2.5 grammes, the animals dying on the twelfth, fifteenth, sixteenth, and twentieth day of the experiment.] 1. Morbid changes are subject to more pronounced individual variations, comparatively with the former two drugs. 2. The brains and lungs are less congested. 3. The liver is sometimes congested, sometimes decidedly anæmic. 4. The spleen is sometimes dry, sometimes normal. 5. The kidneys are more or less congested. 6. The numerical strength of red blood-corpuscles decreases gradually and steadily from the very beginning. 7. Their volume remains unchanged (while under the influence of thallin, and still more under that of antipyrin, it is increased). 8. There is observed a post-mortem formation of strikingly dense, voluminous, dark blood-clots in the cardiac cavities (which phenomenon is said to be entirely absent in cases of poisoning by antipyrin and thallin).

IV. *General Conclusions.* — 1. Antipyrin, thallin, and antifebrin, when used in large doses, give rise to profound disturbances in the general systemic nutrition, as shown by progressive emaciation and prostration, with falling-out of hair and development of cutaneous ulcers, ending in death. 2. Of the three drugs, thallin appears to be the most and antifebrin the least injurious to the organism. 3. The morbid anatomic lesions, as found at the necropsy in fatal cases of the poisonings under consideration, cannot sufficiently explain the actual cause of the animals' death.

THE FUNCTION OF THE STOMACH, AND THE THERAPEUTIC RESULTS OF WASHING OUT THE STOMACH IN INFANTS.

Leo has investigated one hundred and thirty-four cases in infants, by washing out or sounding the stomach, and reported his results at a recent meeting of the Berlin Medical Society (*Medical Chronicle*, January, 1889). The sound has an internal circumference of five millimetres and an external of eight millimetres. When the stomach contains anything, it is usually spontaneously emptied; at other times the fluid contained in the lower part of the tube was examined, always undiluted, because small quantities of matters may escape observation when diluted, and an acid reaction may be changed on dilution to a neutral one. Thirty-five healthy children were examined, and among them twelve newborn, from two hours to eight days old. The reaction after human milk was always neutral or feebly alkaline, after cow's milk slightly acid or slightly alkaline. Free hydrochloric acid could be found in the full stomach only after the lapse of an hour. Sometimes lactic acid was found, but never fatty acids. In the fasting stomach hydrochloric acid could almost always be found. From the fact that free hydrochloric acid is only found at the end of digestion, or in the empty stomach, it by no means follows that none is produced during digestion; it is only partially neutralized, partly transformed into acid salts. This acid-combining power of milk is decisive for the use of milk in ulcer and hyperacidity. Propeptone was almost always found in the fasting as well as in the full stomach. Rennet ferment was always present; once, where it was doubtful, its enzyme was present. It was also found when hydrochloric acid was absent, and sometimes in large quantities. In suckling infants the stomach contents are not unfrequently streaked with rusty altered blood-coloring matter, which arises not from blood swallowed intrapartum, but probably from slight gastritis, as a result of the still unusual digestive processes. At a later age this phenomenon disappears.

How long the milk remains in the stomach, and whether the emptying process takes place in gushes, were not ascertained. At all events a considerable quantity had passed into the stomach at the end of half an hour. The time when all is got rid of is subject to variations according to age, and the kind and quantity of food taken. The stomach in breast-fed children during the first week is found empty at the end of half an hour, while in older ones a considerable quantity of food remains at that time. The milk extracted after a certain time was examined for propeptone and peptone, and compared with a sample of the milk given. After resting in the stomach for half an hour a considerable increase was found in both propeptones; peptone was only present half an hour later. Peptonization and the secretion of acid consequently take place in the stomach. The child's stomach serves chiefly as a reservoir for milk, the whole would be peptonized in the intestine. The clotting of the milk might be supposed to be a preliminary step essential to its digestion, but experiments with trypsin on clotted and unclotted milk gave no essential difference. A part of the micro-organisms entering the stomach are certainly hindered in their development by the acid. Whether the stom-

ach acts as a kind of bulwark against the penetration of organisms future work must show.

Fifteen minutes after food the reaction is always distinctly acid. Free acid is, however, not present till the end of digestion, but always in the fasting state. The quantity of acid secreted is considerably less than in adults.

The pathological conditions were studied in one hundred and four cases, sixty of acute dyspepsia with or without vomiting and with or without fever and intestinal mischief, twenty-two of expressed cholera infantum, sixteen of gastric catarrh, six of habitual diarrhœa without disturbance of the appetite. The reaction was always acid except in some breast-fed children. Volatile fatty acids, lactic acid, acetic and butyric acid, were frequently present. The quantity of the latter may be very considerable. In one case the total acidity was equal to sixty cubic centimetres of one-tenth normal soda solution and fatty acids formed two-thirds of this. Not seldom an abnormally high percentage of hydrochloric acid was present, particularly in subacute dyspepsia. Pepsin or pepsinogen was found in the majority of cases; rennet ferment was always present, therefore the milk was always clotted. One of the most constant accompaniments of dyspepsia in infants Epstein has pointed out,—namely, the lengthened stay of the milk in the stomach. In one case Leo found twenty cubic centimetres of highly acid milk, containing much fatty acid, after seven hours. A similar condition was found also in chronic dyspepsia and in diarrhœa. This atony of the stomach is apparently not the cause but the result of the disease, for the slowing of the emptying process remained in several cases days after all other subjective and objective symptoms had disappeared. Tough mucus is present frequently in both acute and chronic dyspepsia. In two cases there were large coagula, consisting of mucin, in which epithelium, yeast-cells, and bacteria in large quantities were enclosed. On the introduction of the sound, gas escapes frequently, and also in healthy children.

Two points are to be insisted upon,—1, it is easy to understand from these experiments why in dyspepsia of children hydrochloric acid either is without effect or acts injuriously; 2, the unsuitability of the administration of pepsin. On the contrary, the author's experiments show the benefit of washing out the stomach, because it is a certain means of removing the contents and compensating a dyspepsia, and is a handy method unattended by danger. Water, or water with a few drops of a twenty per cent. alcoholic solution of thymol, was employed, chiefly for washing out. Diluted milk or milk gruel is the best diet, in small quantities. The result is generally very favorable. Often one washing out suffices; in many, two; rarely seven were required. Vomiting ceases in a surprising way and appetite returns. The best results were obtained in acute gastritis, where frequently after one washing out fever and fits ceased. Less favorable were the results in cholera infantum, but always satisfactory, likewise in cases of chronic gastritis, with or without intestinal affection. Cases of habitual vomiting gave very good results, and in obstinate diarrhœa the thymol solution proved very serviceable.

Baginsky agreed with Leo as to the favorable results obtained from washing out, but it is to be avoided when the peritoneum is affected, and in cholera when collapse threatens, because the latter is apt to follow immediately the use of the tube. It is a sovereign remedy in habitual vomiting after weaning, in atonic states of the intestine, as in rickets, and also in many cases of chronic dyspepsia.

Hensch had in collapse of cholera obtained very favorable results from repeated subcutaneous injections of common salt solution.

PILOCARPINE IN THE TREATMENT OF BRIGHT'S DISEASE.

In the *Lancet* for December 22, 1888, MR. J. G. MARSHALL reports the case of a young man, aged 19, which illustrates in the most striking manner the value of pilocarpine in the reduction of œdema and dropsy from Bright's disease. When Mr. Marshall was called to the case, he found the patient propped up in bed, and dropsical from head to foot; his eyelids, which were distended with effusion, completely closed the eyes. His face was livid, and the swollen condition of the cellular tissue of the neck made it almost as broad as his shoulders. He coughed incessantly, there was copious intrathoracic effusion, and the subcutaneous tissue all over the chest was "doughy" to the touch. His abdomen was as big as a barrel, and there was extensive œdema of the genitals. His legs and thighs were enormously swollen, and

water was exuding from them. He was passing a very small quantity of urine, which was of a dirty color and loaded with albumen.

As a last resource, Mr. Marshall administered subcutaneous injections of hydrochlorate of pilocarpine, following it the next day by two other injections of ¼ of a grain each, one in the morning and the other late in the afternoon. He covered the patient with blankets after each dose. The first effect was a flushing of the face, the saliva was secreted copiously, and within five minutes he broke out into a profuse perspiration. After the first injection he expressed himself as relieved, and he certainly coughed less. His appearance on the next day was much improved; he had passed a fair night, and the dyspnœa was lessened. The administration of two injections daily was continued for three or four days, and after each administration he sweated most profusely. As the patient became very faint after the injection, to counteract this a good dose of gin and water was given before the next one, and this was repeated each time afterwards, when he never complained of faintness. Vomiting also occurred, once or twice severely, which led to the dose being reduced to ⅓ of a grain, which was injected daily for nine or ten days. The improvement which commenced early was well maintained. At the end of a week he could sit up in bed, the cough was much less, the thoracic effusion had completely subsided, and his arms and neck were becoming less œdematous. At the end of a fortnight the upper parts of his body were free from effusion, but the abdomen was still much distended, and it hardly seemed possible that an accumulation could be gotten rid of which at one time threatened to rupture the skin, and which it seemed that nothing but tapping could relieve. ⅓ of a grain on alternate days was kept up for a fortnight. He was then passing his usual quantity of urine, the albumen much diminished in quantity, and there remained but a little swelling of the abdomen and legs. The injections were continued till the remaining dropsy had subsided. The improvement was maintained, and, under a diet of plenty of milk and the administration of steel and convallaria majalis, he was able to go out of doors and enjoy life with comfort. Mr. Marshall states that he has had good results from the use of an infusion made from the leaves of jaborandi, and drunk hot like ordinary tea; but the drawback appears to be the nausea so easily excited in these cases.

ETHER VAPOR FOR TINNITUS AURIUM.

In a paper read before the Cincinnati Academy of Medicine, Dr. J. E. Boylan has reported a case of tinnitus aurium in which great improvement followed the use of ether, insufflated in the form of vapor through the Eustachian catheter. The patient was a man 40 years old, who had suffered from chronic otorrhœa since childhood. After the first application of the ether very carefully carried out, the patient returned much elated; the noises, previously almost continuous, had ceased shortly after the application, and did not return for six or eight hours. After the second application of the ether, relief was experienced for double this period. The symptoms continued to yield to the treatment, and the patient obtained a rest at night such as he had not known for a year. In order to satisfy himself that it really was the ether vapor that was benefiting the patient, Dr. Boylan substituted water upon two occasions; but this change was followed, in both instances, by a complaint that the noises had been severe and almost ceaseless. Upon another occasion, when the ether in the bottle used had become almost exhausted, the treatment had very little effect; but, after replenishing the bottle, the good results were again immediately manifest. The patient had been treated for over two months when the report was made; his general condition was much improved; the noises, which were only discernible at intervals, were slight and of a totally different character.—*Druggists' Circular*, January, 1889.

BUTYLCHLORAL IN TRIGEMINAL NEURALGIA.

There are but few remedies which exert their action on a special division of the nervous system alone. According to Dr. O. Liebreich, butylchloral illustrates an exception to the general rule, since he claims that, when administered internally in doses of from 15 to 45 grains, it produces anæsthesia in the region supplied by the trigeminal nerve. He therefore has employed it—and he claims with success—in neuralgic affections of the trigeminal nerve, it serving to reduce facial pain dependent either upon rheumatism, traumatic pain from inflammation of the pulp of the teeth, or periostitis, while it may likewise serve to reduce the pain experienced in filling the teeth. The taste of butylchloral is extremely disagreeable, and it is highly in-

soluble and needs some special form of prescription. He recommends it to be combined with alcohol and glycerin,—1 part of butylchloral to 2 of alcohol and 4 of glycerin in 240 parts of water.—*Internationale Klinische Rundschau*, December 16, 1888.

THE EFFECT OF GLYCERIN ON THE QUANTITY OF VAGINAL SECRETION.

A paper with this title was read by Dr. Herman at the meeting of the Obstetrical Society of London, December 5, 1888 (*British Medical Journal*, December 15, 1888). Dr. Herman related observations made to see whether the commonly, but not universally, accepted belief, that the local use of glycerin caused a flow of fluid from the vagina, was correct or not. The observations were made with cotton-wool plugs soaked in glycerin, and with pessaries made of gelatin and glycerin. The amount of glycerin inserted into the vagina was weighed; the discharge from the vagina was weighed, and the amount of vaginal discharge from the same patient when glycerin was not used was also ascertained by weight. The result of the observations was in favor of the following conclusions: 1. That when the secretions poured into the vagina were not abundant the local use of glycerin increased them. 2. That when the secretions poured into the vagina were already abundant the local use of glycerin did not increase them.

Dr. Champneys asked whether Dr. Herman had estimated the loss on the diapers from evaporation. The conditions were favorable for evaporation, and would confirm the conclusions arrived at in the paper.

Dr. Griffith said that it was important to make sure whether the vaginal secretions were formed in the vagina or were merely retained in that canal. The vagina was anatomically skin, and actually became dry skin in procidentia and cystocele, and then no secretion could be found but what was evidently uterine. Glycerin would then act on the vagina as on any surface skin, irritating it and, by absorbing the moisture in the surface-cells, rendering it more dry than before. In Dr. Klein's opinion, the acidity of vaginal mucus, like that of the sweat, was due to decomposition.

After some observations by Dr. Braxton Hicks, Dr. Herman, in reply, stated that he thought the loss of weight by the napkins or pads due to evaporation was but slight; on the other hand, the perspiration from the skin with which the napkin was in contact, might cause a slight increase in weight. Dr. Herman had used the words "secretion poured into the vagina," which did not imply any opinion as to their source. Whether the secretion was of uterine or vaginal origin, whether it was produced by glandular activity or simple osmosis, he could not tell. He would be obliged if Dr. Griffith could suggest any method, harmless to the patient, by which the excretions of the uterus could be separated from those of the vagina. Dr. Herman believed that the vagina did secrete mucus. In cases of atresia of the vagina at more than one place, collections of mucus fluid were found between the occlusions. In cases of atresia of the os externum, the vagina was as moist as in most other patients. That under pathological conditions the vagina might pour out fluid in abundance needed no demonstration.

A NEW ANTHELMINTIC.

Dr. Parisi accidentally discovered that the cocoanut possesses anthelmintic properties. Two hours after eating the endocarpium of the nut and drinking the juice he felt slight nausea, gastric disturbances, and slight diarrhœa. On the following morning he passed a large tænia, with the head attached. Thinking that perhaps the cocoanut had led to this result, he made inquiries as to whether similar success had ever been attributed to the use of the cocoanut, but without obtaining any satisfactory replies. He then repeated the experiment in his patients in Athens; in six cases he noted success in producing the evacuation of the tæniæ. Should Dr. Parisi's results be confirmed, the cocoanut is to be preferred as an anthelmintic from the fact that it needs no previous preparation, and on account of its freedom from disagreeable taste, etc.—*Schmidt's Jahrbücher*, December 15, 1888.

MORBID CHANGES IN POISONING BY COCAINE.

While the physiological and clinical literature of cocaine has attained already truly enormous dimensions, the chapter on morbid lesions arising under the influence of the alkaloid remains yet almost untouched. Hence the practitioner cannot help feeling very grateful to Dr. Vasily M. Zantchevsky, of

St. Petersburg, who has just published an ably written experimental work ("St. Petersburg Inaugural Dissertation," 1888, p. 39; analyzed by Dr. V. Idelson, *London Medical Recorder*, December 20, 1888) aiming to fill up an important gap in our knowledge of a drug which undoubtedly represents the most brilliant acquisition of modern therapeutics. Dr. Zantchevsky's experiments, conducted under the guidance of Professor N. P. Ivanovsky, were made on healthy adult dogs (animals which are fairly sensitive in regard to cocaine, as Professor Anrep has first pointed out) into which (usually Merck's, sometimes Boehringer's) hydrochlorate of cocaine was injected hypodermically. In one group the effects of lethal doses, and in another chronic poisoning, were studied.

I. *Acute poisoning* was induced in five animals whose body's weight varied from five thousand to nine thousand one hundred grammes (about ten pounds), by injecting from .15 (about 2 grains) to .27 gramme (or .03 per one kilo) of cocaine, the animals dying in from twenty-five to sixty minutes after the injection. The train of toxic symptoms was fairly uniform. For a few minutes after the injection the dog either did not present anything abnormal, or fell into a kind of stupor; then there appeared dilatation of pupils, restlessness, extreme dyspnœa, and acceleration of the pulse, and, in fifteen minutes, attacks of clonic spasms, lasting for half a minute or so, and alternating with paroxysms of typical Cheyne-Stokes's breathing; later on there supervened complete general anæsthesia, dilatation of the palpebral slit, congestion of the conjunctiva, lachrymation, cyanosis, loss of consciousness, incontinence of urine and fæces, stertorous breathing, tremor of the whole body, and progressive failure and retardation of cardiac action.

II. *Chronic poisoning* was brought about in four dogs (weighing from five thousand six hundred to eight thousand two hundred grammes) by injecting cocaine in doses gradually ascending from three or four (about .5 per one kilo) to ten or sixteen centigrammes a day, the whole amount taken during the experiment varying from 1.08 to 7.8 grammes, and death ensuing in from forty-three to one hundred and seven days. The initial small doses gave rise to acceleration of breathing and pulse, fleeting (fifteen minutes') general restlessness, also consecutive weakness of the animal's hind limbs, mydriasis, and rise of the rectal temperature (.3° to .5° C.), the symptoms disappearing in about three hours. Increased doses produced the same but ever more pronounced and prolonged symptoms. The 7-centigramme doses induced sometimes *manège* movements of two or three minutes' duration, with extreme restlessness, followed in four hours or so by as extreme weakness and lassitude. The 8-centigramme doses gave rise to stupor, with high dyspnœa, acceleration of the pulse, and mydriasis, of two or three hours' duration. The 1-decigramme doses caused a complete narcosis, rise of the rectal temperature (1° C.), decrease of general sensibility, and other symptoms of acute poisoning. In two of the animals there occurred several attacks of clonic spasms. Both of them died suddenly after a convulsive paroxysm, with consecutive profound prostration. The other two sank gradually from progressive extreme cachexia (which, however, was more or less pronounced also in the former two dogs).

III. *Morbid lesions*, either in acute or in chronic poisoning by cocaine, did not represent anything characteristic or pathognomonic. A. *Microscopical Examination.*—In acute poisoning there were invariably found all those alterations which occur in cases of fatal asphyxia,—such as dark fluid blood, engorgement of the thoracic veins, dilatation of the right auricle and ventricle of the heart, venous congestion and œdema of the lungs, extravasations under the pleuræ, pericardium, endocardium, and gastric mucous membrane, cyanotic liver, contracted spleen, moderate hyperæmia of the brain and spinal cord, and a more intense one of their meninges. The same changes were present also in those two cases of chronic poisoning which had terminated suddenly, while in the eminently cachectic two cases there were detected extreme anæmia and dryness of all organs except the brain, medulla oblongata, spinal cord, and cerebro-spinal meninges, which were intensely congested. B. *Microscopical Examination.*—*Blood* did not present any structural changes. *Lungs:* In acute cases there were present dilatation of the alveolar vessels, with extravasations and occasional collapse of the alveoli; opaque swelling of the alveolar epithelium; hyperæmia and extravasations in bronchioles. *Liver:* In acute poisoning there were found opaque swelling and granularity of hepatic cells, hydropic and granular degeneration of the epithelium of gall-ducts; serous infiltration of the interlobular connective tissue; engorgement of the interlobular and central veins, with occasional small-sized extravasations in their neighborhood; and a distinct

increase of glycogen in hepatic cells. [The latter statement is in accord with Professor Tarkhan-Mouravoff's observations, according to which large doses of cocaine rapidly give rise in dogs to glycosuria of about five hours' duration; *vide* the *Jürnal dla Normal. i. Patolog. Histolog.*, etc., vol. vi.] In chronic intoxication, Dr. Zantchevsky found atrophy and albuminoid degeneration of hepatic cells, atrophy of the interstitial tissue, and atrophic attenuation of vascular walls. *Heart* presented considerable lesions in every one of the cases. In acute poisoning there were found initial signs of albuminoid degeneration of muscular fibres; minute extravasations in the subpericardial and, in a lesser degree, in the subendocardial and interstitial connective tissue; tumefaction of the endothelium of capillaries; opaque swelling and (non-fatty) granularity of many cardiac ganglia, with indistinctness of their nuclei. In cachectic chronic cases the degenerative (albuminoid and fatty) changes were still more pronounced, the muscular fibres having lost their striæ and being intensely granular, while the vessels were empty and their walls atrophied; the cardiac ganglia presented extensive fatty degeneration and atrophy of their cells with vacuolization of the protoplasm, their nuclei being extremely indistinct. The *medulla oblongata*, especially the *spinal cord*, proved to have undergone still more profound alterations. In acute cases there was invariably met albuminoid degeneration of ganglionic cells of the medulla oblongata, anterior and posterior horns, Clarke's columns and Roland's gelatinous substance, the spinal changes being especially pronounced in the regions of the cervical and lumbar enlargements. There were found, further, dilatation of perivascular spaces, small extravasations in the gray matter, and occasionally mucoid degeneration of the epithelium of the central canal. In chronic poisoning, side by side with the same (but more intense and more extensive) degenerative lesions, there were detected hyaline degeneration of nerve-cells in the spinal gray matter, engorgement of veins and capillaries (especially in the gray substance), and such changes of vascular walls as proliferation of their nuclei and hyaline degeneration, with consecutive varicosity of the diseased vessels. All those lesions in the medulla and spinal cord had a circumscribed character,—that is, were scattered in a patch-like manner over various districts of the organs. Dr. Zantchevsky is inclined to think that "the degenerative changes arising in the nerve-centres under the influence of cocaine may be partly explained (apart from a still obscure specific action of the alkaloid on the nerve-elements) by a disturbance in the circulation of the central nervous system, which is caused by the drug. In acute poisoning cocaine brings about, in the first instance, a rise of the blood-tension, with a consecutive diminution in the supply of arterial blood; a subsequent fall of the blood-tension and a synchronic disturbance of breathing lead to a profound alteration of the blood in regard to its gaseous ingredients; hence the altered blood becomes an additional irritant agent; and hence there arise disturbances in the nutrition, and degenerative changes of the nerve-cells." It would be superfluous, of course, to dwell on an extreme sensibility of the nerve-tissue towards any slightest deviation in the circulation or the composition of blood. In conclusion, Dr. Zantchevsky draws attention to a close similarity between the morbid lesions in the nerve-centres as found by him in cases of the cocaine-poisoning, and those detected by Dr. Cziz in cases of acute and chronic poisoning by morphia and atropia (*Meditz. Pribavl. k' Morsk. Sborn.*, May and June, 1883), the difference being only a quantitative one; the former are somewhat milder comparatively with the latter. Perhaps there exists a still greater similarity between the alterations caused by cocaine and those found in the nerve-centres and their blood-vessels in starvation (as described by Drs. V. Mankovsky [the *London Medical Record*, February, 1884, p. 73] and V. Rosenbach, in his "St. Petersburg Inaugural Dissertation," 1883). Judging from that analogy, Dr. Zantchevsky arrives at the general conclusion that "the cause of those degenerative changes as occur in chronic poisoning by cocaine should be sought in disturbed nutrition of cellular elements, which, in its turn, depends upon lesions of vascular walls, caused by a direct action of the alkaloid."

FLUSHING THE PERITONEUM.

The practice of washing out the peritoneal cavity in abdominal sections where much blood, serum, or other fluid or semifluid matter has been effused, is a most important innovation in modern surgery. Certain well-known and distinguished British specialists are zealous advocates of this system of flushing the peritoneum, which they have practised with great success. A full stream of

water at blood-heat, poured into the peritoneal cavity, detaches clots, etc., which sponges may fail to remove, counteracts the effects of chill caused by the opening up of the great serous cavity, and likewise acts as a hæmostatic. The advocates of flushing insist on the necessity of subsequent drainage.

The good results of flushing the peritoneum, according to the testimony of experts, have tempted others to try the practice, not always with similar success. Indeed, a distinguished French surgeon recently read before the Paris Obstetrical Society an important paper on the danger of flushing the peritoneum during abdominal section. In one case the patient was placed in great peril. In a second case death occurred. A patient, whose age is not stated in the report published in the *Journal de Médecine de Paris*, suffered from suppurating oöphoritis on the left side, and double salpingitis. At the operation the appendages could not be removed until intimate adhesions had been broken down. The peritoneum was flushed with "hot distilled water," and during the process profound syncope, with suspension of respiration, took place. Artificial respiration was carried on at first in vain, and a tracheotomy wound was made in the integuments of the neck, when immediately spontaneous inspirations occurred, and the patient thenceforward did well. In the fatal case the patient was a single woman, aged 28. She took chloroform badly, the excited stage was long, and she readily came to, though plenty of chloroform, out of "a new bottle," was administered on a piece of lint. A large cyst had to be shelled out of the broad ligament. As much blood was effused, M. Polaillon determined to flush the peritoneum. He employed distilled water, previously boiled, and containing 1 part of carbolic acid to 100. The water was poured into the pelvic cavity through a wide glass canula, at a temperature of about 99° F. After the flushing had been carried on for about three minutes, respiration became rapid, then grew feeble and ceased; the face became blue. The heart continued to beat regularly. The alarming symptoms began at a quarter-past ten o'clock. Artificial respiration was continued till eleven. Then a few feeble inspirations began, and continued for a quarter of an hour; the pupils were then half contracted. The heart beat regularly and quickly. The patient continued unconscious. M. Polaillon immediately closed the abdominal wound, fixing the broad pseudopedicle outside. Notwithstanding inhalations of pure oxygen, friction, injections of ether, electricity applied to the level of the attachments of the diaphragm, and other stimulant measures, spontaneous respiration could not be permanently maintained. Once more artificial respiration was tried. Phlebotomy only resulted in the escape of a few drops of very dark blood from the left arm. Gradually the heart's action became more and more feeble, the face grew pale, flatus escaped from the anus, and the pupils dilated. A few minutes before noon the patient was evidently dead. The patient had been thirty-five minutes under chloroform. About one ounce and a half of the anæsthetic was used up, but not nearly that amount could have been actually inhaled.

M. Polaillon observed that this death was not only caused by chloroform; the flushing of the peritoneum must also bear part of the blame. He noted severe syncope in two cases at the moment when he injected very hot water into the abdominal cavity in order to wash coils of intestine and the peritoneum in general. Respiration was maintained in both these cases. In the instance above described at length the coincidence of the flushing with the cessation of respiration was equally marked. He specified that he at first poured about half a gallon of hot carbolized water into the pelvis, and, as the water came out strongly blood-stained to the last, he poured in more water, accidentally hotter than the first supply. The pelvis being full, the water reached the upper part of the abdominal cavity. It was at this moment that respiration ceased. M. Polaillon believed that the stimulus of the hot water touching the diaphragm or the solar plexus caused, by reflex action, the arrest of respiration and syncope. He likened the accident to the effects of a contusion in the epigastric region. This arrest of respiration was liable, as in this case, to remain permanent in a subject under chloroform, which already weakened the respiratory influence of the medulla. He advocated the placing of the lower part of the patient in a lower position than the upper, so as to prevent the water used in flushing from running towards the diaphragm. M. Polaillon also maintained that the water should never be over 99°. Some authorities may think that the presence of carbolic acid increases the danger of flushing. M. Polaillon's case decidedly deserves the serious consideration of all operators, now that the practice of flushing is becoming more and more general.—*British Medical Journal*, December 22, 1888.

THE OPERATIVE TREATMENT OF HYDROCELE.

The last number of Professor Bruns's *Beiträge zur Klinische Chirurgie* contains a paper on the "Operative Treatment of Hydrocele and its Ultimate Results," in which DR. HERTZBERG, of Tübingen, endeavors to prove the superiority of incision over injection by a record and analysis of forty-six cases, in which Volkmann's radical operation was performed. The youngest patient was 12 years of age, and the oldest 56 years; in six cases the hydrocele affected both sides of the scrotum. The operation in each case was performed with full attention to antiseptic details. The vaginal cavity was washed out with a weak solution of corrosive sublimate; a drain-tube of medium size was passed through the cavity, and brought out through a counter-opening at the lower part of the scrotum, and the seat of operation and the surrounding parts were finally covered by a dry dressing of wood-wool. Professor Bruns practises partial excision of thickened indurated or superfluous tunica vaginalis, but holds that total excision of this membrane is not required, save in very exceptional cases. Care was taken to relieve the vaginal cavity of all products that were supposed to be associated with the disease, and in cases where such morbid conditions existed, deposits and growths were removed from the tunica vaginalis, and hydatid and other cystic growths from the testis or epididymis. In thirty-three cases recovery took place without any signs of local or general reaction. In eight cases there was severe general reaction with subjective disorder and prolonged fever. Such conditions, which, however, are now but very rarely observed, are the result of interference with primary healing by effusion of blood into the vaginal cavity, of inflammatory œdema of the scrotum, of swelling of the testis, or of suppuration in the perineum or the anterior abdominal wall. In a large majority of the cases collected by Hertzberg the drain-tube and sutures were removed on the fifth or sixth day, and the patient was able to leave his bed at the end of the first, or the beginning of the second, week. The average duration of the stay in hospital was a little over sixteen days. In this respect Volkmann's operation seems at first sight to compare unfavorably with injection of iodine. The usual duration of hospital treatment by the latter method is from eight to ten days, but, it is pointed out, injection is very often followed by tenderness and swelling of the scrotum and effusion into the vaginal cavity, which may last for weeks, and even for months. All the patients treated by incision and drainage at Tübingen were discharged as cured, and the primary results were all very favorable. By subsequent inquiry and observation Hertzberg has made out that the benefits derived from the treatment have been maintained, and that forty-five out of forty-seven hydroceles treated by cutting operation have been permanently cured. By comparing tables, derived from different sources, of carefully-recorded and long-observed cases of hydrocele treated by incision and injection, he finds that the relapses after the former treatment constitute from three to four per cent. of the total number of cases, while those after treatment by puncture and injection of iodine amount to eight per cent. In conclusion, Hertzberg expresses it as his opinion that incision is the most rational method of treating hydrocele, especially with regard to the certainty of obtaining a permanent cure, and that in future it will be more frequently practised, as the appreciation of the value of antiseptic surgery becomes more widely spread.—*London Medical Recorder*, December 20, 1888.

THE USE OF CHLORIDE OF METHYL SPRAY.

M. BARDET proposed before spraying a surface with chloride of methyl, in order to produce local anæsthesia, to paint it with glycerin. The revulsive action is less acute and less severe, while the glycerin forms a surface on which the drops of the refrigerant mixture collect, and which may be readily removed after the desired effect has been produced. The use of glycerin is said to entirely do away with the danger of sloughing.—*Gazette Hebdomadaire de Médecine et de Chirurgie*, November 23, 1888.

THE THERAPEUTIC APPLICATION OF STROPHANTHINE.

In *La Tribune Médicale*, November 18, 1888, MM. GERMAIN SÉE and GLEY report the results obtained by the use of strophanthine. They have used it especially in mitral lesions, and particularly in contraction of the mitral orifice, and the results obtained by its use are favorable. The authors find the explanation of this fact in the increased cardiac power produced by this drug as determined by sphygmographic tracings. Within an hour the pulse visibly strengthened, the line of ascension in the tracings, which had

been almost horizontal, becoming rapidly nearly vertical; the line of descent suddenly falls and the dicrotic wave disappeared, while the irregularities and inequalities of the pulse almost always are overcome. The authors claim that even where the heart had lost its power, where compensation no longer existed, and where there was marked pulmonary stasis and œdema, they had used it with success. In none of these cases, however, was there any relief of the dyspnœa, no increase of diuresis, and consequently no diminution of the œdema. In cases of dilatation of the heart, and hypertrophy depending upon generalized arterio-sclerosis, the same results follow the administration of strophanthine,—that is, strengthening of the pulse and augmentation of the general strength. In painful affections of the heart, such as angina pectoris, strophanthine, so far from being useful, even appears to aggravate the condition. No disturbing effects have been noticed either on the stomach or on the brain, with the exception of transient vertigo noted in a certain number of cases.

THE ACTION OF INHALATIONS OF CHLORIDE OF ETHYLENE ON THE EYE.

We have already alluded to the statement made by M. Raphael Dubois as to the fact that inhalations of chloride of ethylene employed as an anæsthetic lead to opacity of the cornea, and perhaps even to glaucoma. M. PANAS has likewise experimented with the chloride of ethylene, and he reports his results as follows (*La France Médicale*, December 11, 1888): Anæsthesia may be produced in the dog after an inhalation of about 80 minims of chloride of ethylene in a time varying from twenty to thirty minutes. On prolonging the inhalation from three-quarters of an hour to an hour, the following phenomena were noticed in the eyes. The injection of the conjunctiva did not occur until four hours after the inhalation. The pupil was dilated, and remained in the dilated condition for several days. The cornea became opaque after the first inhalation, and this did not disappear until a week or more subsequently, gradually disappearing from the outer edge to the centre. On four dogs, after the cornea had cleared up, subsequent inhalations did not appear capable of producing any new corneal trouble, and it seemed as though the animal had become habituated to the drug. On the other hand, in another animal a new inhalation before the opacity had been reduced lead to an increase of the trouble. Contrary to the conclusion of Dubois, Panas states that, so far from the eye becoming glaucomatous, he has often noticed a reduction of the ocular pressure. His histological studies showed that there was marked serous infiltration of the cornea, while the anterior epithelium, as well as Bowman's membrane, remained intact. On the other hand, the endothelium of Decement's membrane was nearly always found detached or destroyed; the cells were the seat of karyokinesis. The other parts of the eye—the iris, choroid, retina—did not show any noticeable alterations. The conclusions which are drawn are: first, that the corneal trouble produced by the inhalations of the chloride of ethylene is dependent upon the serous infiltration of the corneal parenchyma; second, that the mechanism of the production of œdema of the cornea depended upon the destruction by this agent of corneal endothelium, which alone protects the cornea from invasion by the aqueous humor.

THE TREATMENT OF OBESITY.

In the *British Medical Journal* for November 10, 1888, DR. W. T. SMITH reports a method of reduction of obesity which proved so successful in his own case that he has tested it in forty-two other cases, in most of which success was obtained. The plan which he follows is to confine the diet to rump-steak, codfish, and hot water for fourteen days, with the absolute exclusion of everything else. Taking meat in large quantities may lead to dyspepsia, but this can be easily overcome by reducing the meat to an essence. This may be done as follows: Take four pounds of beef, free from skin and fat; cut it to pieces about an inch square; place the meat in a close-fitting, air-tight jar; stand the jar in a pan of boiling water, and let it simmer for six hours. Pass the juice of the meat thus obtained through a sieve; then measure four ounces of the fibrin of the meat; pulverize it in a mortar, and stir it up with the essence; divide this into four doses, and you will obtain the nitrogenous elements required of the quantity of meat to be taken at one meal. There is also a similar way of obtaining meat essence by using a pot called "Boule Américaine."

In treating his cases, in several instances he has been obliged to modify the amount of hot water and lessen occasionally the quantity of meat; but as regards his own personal experience, he found that three pounds of rump-steak and one pound of codfish were hardly sufficient to satisfy his appetite. The meat

diet and hot water alone must be regularly adhered to for fourteen days, and the amount of hot water, taken at any time during the day, commencing at seven in the morning and finishing at half-past ten at night, varies from six and one-third pints, more or less, according to the powers of the patient.

The second epoch of twenty-one days the diet may be considerably varied, as he reduces the hot water to four pints in the twenty-four hours, and he allows other kinds of meat, such as mutton-chops, free from fat, and chicken; and, as regards fish, grilled turbot, whiting, or soles; a little green vegetable, and some slices of plain unsweetened rusk.

The third epoch, thirty-one days, the hot water is reduced to about a quart a day, and he allows tea, stale bottom crust of household loaf, captain's biscuits, grilled fish, fowl, game, turkey, any joint, hock or claret, with seltzer-water, in place of whiskey. As hot water is very unpalatable, a slice of lemon may be added to each tumbler.

No case of obesity should be treated by this method when the patient is suffering from any organic disease, unless it be some trifling malady. The loss of weight in nearly all cases will vary somewhat, but Dr. Smith states that his patients bear the treatment exceedingly well, and express themselves as feeling far better in health and able to take exercise with comfort. The first period of fourteen days is really the only hardship, and he has found very little difficulty in persuading patients to stick to the diet. As some alkali is essential, he prescribed five grains of the bicarbonate of potassium, to be taken night and morning. Dr. Smith offers to send his diet-cards to any medical practitioner who will write to him, but asking that the result of any case put under treatment be reported to him. The following table shows the results of his method of treatment:

Before treatment.						After treatment.				
No.	Date.	Sex.	Age.	Weight.	Girth.	No.	Date.	Weight.	Girth.
				St. lbs.	Inches.			St. lbs.	Inches.
1	Jan. 3	M.	45	14 10	43	1	March 6	13 2	39½
2	" 10	M.	40	13 12	41	2	" 16	11 10	37
3	" 18	M.	48	15 4	46	3	" 28	13 1	41½
4	" 21	M.	39	14 2	42½	4	April 1	12 1	39¾*
5	" 29	M.	53	16 9	47	5	" 10	14 2	41½
6	Feb. 2	M.	45	12 10	39	6	" 18	11 1	33½
7	" 3	M.	39	14 2½	41	7	" 20	12 3	37¼
8	" 7	M.	42	15 4	44	8	" 18	13 6	39
9	" 10	M.	54	16 2	48	9	" 22	14 5	42½*
10	" 11	F.	33	13 1	37	10	" 24	11 4	32½
11	" 19	M.	39	14 6½	41½	11	" 30	12 8	39
12	" 23	M.	45	13 10	39	12	May 1	12 5	34
13	" 26	M.	52	14 10	42	13	" 6	13 2	39½
14	" 28	M.	49	13 12	39½	14	" 10	11 10	37½
15	" 29	F.	43	15 2	45	15	†		†
16	March 2	M.	51	14 10	41½	16	" 18	12 6	39½
17	" 4	M.	48	13 6	36	17	" 19	11 13	3[illegible]¾
18	" 8	F.	37	13 4	35	18	" 20	12 10	34
19	" 8	M.	59	14 10½	41	19	" 22	13 4	39
20	" 12	M.	42	12 10	34	20	" 24	11 6	33
21	" 14	M.	45	14 5	41	21	" 25	12 7	38¾*
22	" 18	M.	59	14 10	42	22	" 29	13 6	39
23	" 18	M.	41	13 10	39½	23	" 30	12 2	35½
24	" 23	M.	52	13 12	41½	24	June 3	12 6	40
25	" 29	M.	32	13 8	39	25	" 10	11 6	36½
26	April 1	M.	49	14 10	43	26	" 12	12 11½	38
27	" 8	M.	37	13 2	38½	27	" 29	12 0	34
28	" 10	M.	51	15 10	44½	28	" 28	13 8	41¼
29	" 18	M.	31	12 9	38½	29	July 1	11 2	34
30	" 20	M.	49	13 13	41	30	" 8	12 3	38½*
31	" 29	M.	28	14 10	44½	31	" 7	12 1	37½
32	May 4	M.	39	13 12	42	32	" 15	12 4	38
33	" 10	M.	42	14 1	41	33	" 20	12 7	37
34	" 15	M.	49	13 10	39	34	" 20	12 2	38¾*
35	" 20	M.	52	14 8	45	35	Aug. 4	12 6	39½
36	" 29	M.	49	13 13	41	36	" 14	12 8	38
37	June 1	M.	42	15 12	43	37	" 27	13 6	39½
38	" 5	M.	51	14 10	42	38	Sept. 2	12 10	38¾
39	" 20	M.	42	16 1	48	39	" 8	14 5	43
40	" 24	M.	39	13 8	39½	40	" 12	12 1	36
41	" 27	M.	45	14 10	42	41	" 20	13 1	39½
42	July 1	M.	50	15 4	45	42	" 28	13 6	40½

* Treated by letter.

† Failure; would not conform to rules.

CURE OF SPASMODIC COUGH BY SPRAYING WITH CHLORIDE OF METHYL.

Recently, at the meeting of the Société de Médecine Pratique, Dr. Huchard demonstrated the favorable action of spraying with chloride of methyl in spinal irritation, exophthalmic goitre, chorea, and various other nervous troubles. In the *Revue Générale de Clinique et de Thérapeutique* for January 2, 1889, Dr. Garel reports the case of a young girl, 13½ years of age, suffering from slight polydipsia and polyuria, who had had a choreic form of cough for almost two months. This cough was spasmodic, very loud, and precisely resembled the cough of whooping-cough. The employment of antispasmodics and of cocaine in a ten per cent. solution, applied locally to the surface of the larynx, had produced no relief. Then spraying of chloride of methyl was applied to the neck and upper part of the back, at the same time subjecting the parts sprayed to energetic friction, to protect the tissues from too excessive reaction. On that evening there was some improvement, and six days after a cure of the laryngeal cough was produced.

ALLYL TRIBROMIDE.

"Allyl tribromide" ($C_3H_5Br_3$) has been recently recommended strongly as a remedy for whooping-cough, and also as being useful in the treatment of hysteria and asthma (*Pharm. Post*, December 2, p. 780). In cases of whooping-cough it is administered internally in capsules containing about 5 drops, or injected subcutaneously. "Allyl tribromide" is described as being a colorless or faintly yellowish liquid at the ordinary temperature, but solidifying when cooled below 10° C. to a mass resembling a stearopten, and having a specific gravity of 2.430. In the presence of the use of the name "allyl tribromide" for this compound it may be convenient to recapitulate briefly a portion of its history. In 1857, Wurtz described, under the name "tribromide of allyl," a compound he had obtained by treating allyl iodide with bromine (*Ann. Chim. Phys.* (3), li. 91). It was a colorless neutral liquid, having a specific gravity at 23° C. of 2.436, boiled at 217° to 218°, and at a temperature below 10° C. became solid. These properties differed from those attributed by Berthelot and Luca to the isomeric "tribromhydrin," one of the series of compounds which they had prepared in the previous year by the action successively of phosphorus tribromide and pentabromide upon glycerin (*Ann. Chim. Phys.* (3), xlviii. 304), in which products one or more of the hydroxyls of the triatomic alcohol were replaced by bromide. Tribromhydrin was described by them as a heavy liquid, volatile at about 180° C., slowly decomposed by water, and forming slightly on contact with air. Wurtz, having obtained his "tribromide" by acting on an allyl compound, assumed that it differed from the glycerin derivative, and that in this instance the radical allyl exercised a trivalent affinity. But, in the light of subsequent investigations, this appeared doubtful, and in 1870 Henry announced that Berthelot and Luca had been led into error by the impurity of their material, in their description of tribromhydrin, and that pure tribromhydrin prepared from glycerin showed no difference in physical properties from Wurtz's tribromide of allyl obtained by treating allyl iodide (*Annalen*, civ. 368). This statement was challenged by Berthelot, but was reaffirmed by Henry after repeating his experiments; and allyl tribromide and tribromhydrin, or tribrompropenyl, are given as synonymous terms in the more recent chemical works. — *Pharmaceutical Journal and Transactions*, December 29, 1888.

HAMAMELIS AND HYDRASTIS IN PULMONARY HEMORRHAGE.

One of the weakest points in our therapeutic measures is the treatment of pulmonary hemorrhage. With most cases of hemorrhage from the lungs recovery is rather a matter of good fortune than one for which we deserve any credit, since it is but seldom that the hemorrhage is so severe as to directly and immediately endanger life. It is unfortunately true that while without controlling the hemorrhage most of the therapeutic measures now employed simply tend to disturb intestinal and gastric digestion. In the *Therapeutische Monatshefte* for November, 1888, Dr. Koeniger writes that for the last three years he has been employing almost exclusively the fluid extracts of *Hamamelis Virginica* and *Hydrastis Canadensis* in similar cases. While it is not claimed that these drugs arrest all pulmonary hemorrhages, and while severe hemorrhage is not invariably influenced by them, yet in by far the majority of cases their action is undoubtedly favorable, even after other means have failed. In the cases of periodic hemorrhage from the lungs, the

administration of these drugs before the expected hemorrhage has served to prevent its appearance. Likewise he claims that the drugs themselves produce favorable action on the stomach, and may be regarded as forming a good tonic. When the cough is severe he administers 2 grains of Dover's powder, and this, together with 20 to 30 drops of the fluid extract, is usually sufficient to produce arrest of the hemorrhage.

CHOLECYSTOTOMY.

At the recent meeting of the Royal Academy of Medicine in Ireland, MR. KENDAL FRANKS read a paper on a case on which he had operated for the removal of gall-stones. (*British Medical Journal*, January 5, 1889.) The patient, a lady, aged 52, had suffered from biliary colic, accompanied by severe feverish attacks and jaundice, from December 26, 1886. After her admission into hospital the attacks of pain and fever were almost of daily occurrence. The diagnosis was rendered difficult owing to a tumor which occupied the right side, from the costal arch to the crest of the ilium. A smaller globular tumor was felt between this and the umbilicus during the attacks of pain. The patient was in an emaciated and exhausted condition when the operation was performed. The larger tumor on the right side proved to be an abnormally shaped right lobe of the liver, the long axis of which was quite vertical in direction. The gall-bladder contained four calculi, which were removed through an incision in its anterior wall. No stone or tumor could be found obstructing the cystic duct or the ductus communis choledocus. It was evident that the obstruction was due to a stricture of the common bile-duct. The opening in the gall-bladder was sutured to the abdominal wound. The patient made a rapid recovery, and when seen nine months later she had gained in weight, and looked healthy and well. She suffered no pain or distress, but the bile continued to flow from the fistula in the side. The absence of bile from the intestines seemed to interfere in no way with her health.

MR. BARTON had had a similar case a year before that of Mr. Franks. The patient was an elderly woman, who had suffered from symptoms of gall-stone for many years. She was a good deal emaciated, and her nutrition had suffered from long-continued disease. She was heavily jaundiced, and the abdomen, on palpation, showed a well marked tumor in the region of the gall-bladder. The operation was perpendicular to the costal cartilages, about four inches in length, and the peritoneum was readily reached and opened. He passed his finger into the gall-bladder, and felt through the walls a number of hard gall-stones, some being impacted in the common duct. The anterior wall of the bladder was stitched to the edge of the incision. The lower part close to the gall-bladder having been opened, a large gush of greenish-yellow bile followed, and he removed with his finger three large stones. But the real difficulty was to reach the stone or stones impacted in the duct, which constituted the cause of the obstruction. Squeezing or pressing was out of the question, and the only course was to reach the stone or stones with the finger or the forceps. Once the stone had passed through the duct it was exceedingly difficult to reach or press it in any way so as to make it slip backward. After manipulation he extracted another stone, and concluded that his operation had been successful; but it was not, although the wound was antiseptically dressed, and there was an excellent recovery. There was no peritonitis except in gluing the edges together, and there was no bad result. At the same time there was no relief to the jaundice, and the obstruction remained. The dressings were saturated with bile. She expressed herself greatly relieved, and her appetite increased; but being an elderly woman, she never fully regained strength from the low state of nutrition into which she had fallen; and in the course of three months she died apparently from want of nutrition.

MR. O'CALLAGHAN detailed his experience of four operations in which he assisted Mr. Lawson Tait. The difficulty in removing the stones was surmounted by passing a scoop into the duct and manipulating with the finger outside, so as to work out the stone gradually. He did not stitch the gall-bladder to the opening until after removing the stones. Since then he had had two cases himself, one being successful and the other not; the latter, a woman, however, dying of malignant disease. While the operation was one of the most justifiable, as it was also one of the most brilliant in surgery, the great difficulty was in the diagnosis; and from the results of abdominal surgery he would, where the diagnosis was in doubt, feel justified in making an exploratory incision. Of course, the drainage-tube was not removed until the bile was flowing freely and the temperature became normal.

MR. CROLY thought that the course of closing the gall-bladder and peritoneal surfaces left a space too limited to take out the gall-stones, and there was also the disadvantage of shutting out the surgeon from following the duct, and doing satisfactorily the most intricate part of the operation.

MR. THOMSON did not think there was much difficulty in cutting down on a gall-bladder and removing stones, if stones were there; but the great difficulty was to determine whether or not the surgeon had to deal with a distended gall-bladder. Mr. Lawson Tait, who had the largest experience of any single person in abdominal surgery, had laid down the rule that when he was in doubt as to what was inside, he cut down upon it, and put in his finger and felt it. He had had a case in point in which all the symptoms indicated a distended gall-bladder; but, on cutting down, it was found to be a large perinephric abscess, which extended forward, pressed on the under surface of the liver, on the gall-bladder, and on the duct, and had, from mere pressure, brought on attacks of jaundice, from which the lady suffered. Of course there were certain cases easy of diagnosis; he had himself removed over two thousand gall-stones in a case post mortem. The tumor had been diagnosticated as malignant, and the lady, whom he only saw after death, suffered considerable pain. When she died, however, there was no difficulty of diagnosis. There was an enormous number of little stones, which could be felt, and even heard, when crushed between the finger and the thumb. The escape of bile through the abdominal wall had been noted in many cases, especially where the gall-bladder had been extirpated altogether, suggesting the inquiry as to the precise use of that organ.

MR. FRANKS, in reply, said that Mr. Lawson Tait showed that excision of the gall-bladder was as sensible and justifiable an operation to prevent the formation of gall-stone as to excise the urinary bladder to prevent the formation of stone. There were two distinct classes of cases,—one of large numbers, and the other, more serious, of solitary gall-stones. The large gall-stones became impacted in the duct, and, if left alone long enough, would lead to suppuration. As regards Mr. Croly's justifiable criticism, in his case, before opening or suturing the gall-bladder he felt the surface of the liver carefully, and satisfied himself there was no obstruction in the nature of stone or tumor upon either of the ducts, and there was no necessity to explore the gall-ducts from inside. The real disease was not gall-stone, or stricture of the cystic duct, but stricture of the common bile-duct. As regards diagnosis, a gall-bladder distended with bile, not gall-stone, made the diagnosis a question of extreme difficulty. He agreed that in cases of doubt an exploratory incision was justifiable.

ESCHSCHOLTZIA CALIFORNICA.

At the meeting of the Société de Thérapeutique, held November 14, 1888, M. BARDET related the results of the studies which, in connection with M. ADRIAN, he had made as to the chemical composition of *Eschscholtzia Californica*, a plant belonging to the family of Papaveraceæ, considered in America as a succedaneum to opium, and as an admirable sedative for children (*Gazette Hebdomadaire de Médecine et de Chirurgie*, November 23, 1888). Messrs. Bardet and Adrian have extracted three products from this plant,—glucoside, an organic base, perhaps originating from the action of the reagents on the glucoside, and a small quantity of morphine. Two pounds of the dried plant contain from five to six grains of morphine. The presence of morphine, which has been perfectly demonstrated by various tests, is very interesting, for it has as yet not usually been found in other classes than the papaver.

In reply to a question by Wurtz as to whether morphine had been obtained in crystalline form, and referring to the fact that the crystals of the alkaloid are perfectly characteristic, M. Bardet answered that as yet the morphine had only been obtained in an amorphous form, but that the various tests determined its identity beyond a question.

NON-STRANGULATED HERNIA.

At the recent meeting of the Harveian Society, MR. MITCHELL BANKS read a paper with the above title (*Lancet*, January 5, 1889), in which he divided non-strangulated hernia into two groups,—(1) moderate-sized herniæ, and (2) very large and enormous herniæ. This has been done because they are by no means on the same footing either as regards danger to life from the operation or liability to recurrence of the rupture. In the statistics which he gave the terms were used in the following manner: By "quite sound" is meant that the rupture has never come down since the operation, that there is nothing in the way

of a swelling to be felt or seen, and that there is no impulse on coughing. By "partial success" is meant that the rupture has slightly returned, or threatens to return if unsupported, but that, with the aid of a truss, the patient is in safety and comfort. In many of these cases no truss at all would keep the bowel up before operation, while after it support could be effectually given. In every instance the patients placed in this category declared that they were in a distinctly better position after the operation than before it. By "complete failure" is meant that the rupture is as large and troublesome as before the operation. Among the fifty-nine moderate-sized non-strangulated herniæ two deaths are recorded. One was distinctly due to the operation. The other was doubtful, as the wound was all but healed, and there was no peritonitis or other lesion relating to the wound found after death. Of the sixteen very large and enormous herniæ four cases proved fatal. Septicæmia killed two patients, and unsuspected abscess, bursting into the peritoneal cavity after the patient was walking about and deemed sound, proved fatal in another, while in one case the operation could not be completed. Of the twenty-two cases of strangulated inguinal hernia one, an old man of seventy-seven, died from septicæmia and bronchitis. Of the nineteen cases of strangulated femoral hernia two died, one never recovered from the collapsed state in which she arrived at the infirmary, and another was moribund when admitted. The statistics of permanence of cure showed that, of the one hundred cases of moderate-sized non-strangulated and strangulated herniæ combined, it has been possible to trace for very considerable periods seventy-seven. Of these, forty-eight remain quite sound, seventeen are partial successes, and twelve are complete failures. Of the sixteen cases of very large and enormous herniæ it has been possible to follow up ten. Of these, five remain practically sound (though all requiring some support to prevent return), three are partial successes, and two are complete failures.

Mr. Bryant's experience of those cases in which the sac was removed was that they succeeded best. After celotomy the operation could not be considered completed until the sac had been removed. Operations in children were to be avoided, except where a truss could not be worn. Opening the sac almost quadrupled the risk. In adult life, operation was unadvisable when a truss could be worn. Large herniæ ought to be left alone; he had occasionally been obliged to operate upon them, but a truss must be worn afterwards.

Mr. Kendal Franks agreed that an operation was necessary in adults who could not wear a truss; also in adults who were athletes. A truss was a great detriment. He always, in operating, sutured the neck of the sac and the internal ring. The operation of twisting the neck of the sac could not be applied in cases where the cord was adherent to the sac. Strict antisepsis was essential to success, and good results were obtained either with silk or silver wire. His bias was in favor of operation. In forty cases he had had four returns.

Mr. Edmund Owen was afraid that Mr. Banks would think that the discussion wandered from the actual subject of his paper,—namely, the permanency of the favorable result after operation, and, for his own part, he also was unable to speak definitely of results. He could only say that he was satisfied with the result of his operations up to the present. He had operated upon a good many children, but he entirely agreed with Mr. Banks that children should not be operated on unless the hernia was absolutely beyond the control of a truss; for it was an undisputed fact that, with a fair chance, children did "grow out of" their inguinal weakness. The cases which he preferred for operation were those of adults whose inguinal herniæ were associated with an atrophied or an undescended testis. In such cases the surgeon should remove the useless gland without compunction, and, having ligatured and pushed up the cord, should completely occlude with sutures the inguinal canal. The objection against the removal of the undeveloped testis was purely sentimental, for the gland was, almost for certain, of no physiological value. He did not believe in the surgeon being able to recognize, during the operation, the "internal abdominal ring" and the "conjoined tendon;" at any rate, though he knew them in the dissecting-room, he ignored them in the hospital. He thought that it mattered little in the permanency of cure whether the surgeon used silver, gut, or silk for closing the canal; but he would ask Mr. Banks how he dealt with the sac of that variety of hernia which descended with the tunica vaginalis. He (Mr. Owen) was satisfied to tie the funicular process high up, flush with the peritoneal wall, so as to leave no depression to invite the subsequent descent of the bowel; he then divided the process below the ligature, and removed an inch or so of the testicular part

of it. He did not believe in the desirability of fashioning and suturing an artificial tunica vaginalis, all that might be left to nature. The point on which he specially desired to join issue with the author of the paper was as regards the subsequent wearing of a truss. If the neck of the sac was obliterated and the inguinal canal thoroughly closed, no bowel should descend, and the truss, therefore, was unnecessary. He always favored the use of a truss after the operation, for he had a strong opinion that the constant pressure of the pad went a long way towards promoting the absorption of the plastic material which was thrown out in the neighborhood of the ligature and sutures, and the definite organization of which had a considerable influence in establishing the permanency of the cure. In conclusion, he ventured to congratulate Mr. Banks upon the straightforward manner in which he had reported his cases and results, favorable and unfavorable, and upon the fairness with which he had laid his conclusions before the meeting.

MR. GAGE also spoke, and said it was necessary to wait some time before publishing results. Mr. Banks's statistics were encouraging.

MR. BARKER could trace cases which had remained well four or five years, and thought this too short a time to give proper information. A speedy return had taken place in four of the forty or fifty cases upon which he had operated. The risks of this operation had been reduced to a vanishing point.

In his reply, MR. BANKS said that removal of the sac was best because of its simplicity. He was himself inclined to operate upon those who could wear a truss; but, in any case, removal of the sac was essential, and repaired the irregularity of the peritoneum. He practised stitching of the rings, but it was of less importance. Umbilical herniæ contained so much adherent omentum and bowel that they were seldom suitable for operation.

THE LOCAL APPLICATION OF HYDRASTIS CANADENSIS.

The peculiar feature of the fluid extract of hydrastis canadensis of producing vascular contraction after its internal administration has led to its internal employment in cases of chronic congestion of various organs. It is strange, however, that as yet it does not seem to have been employed as a local application in spite of the fact that pharmacological experiments with hydrastis have shown that this body is not only a local astringent, but also possesses local anæsthetic properties, a fact which led DR. FELSENBURG (*Wiener Medizinische Blätter*, No. 48, 1888) to test the result of local application of the fluid extract of the hydrastis. He states that his results have encouraged him to further experiments in this connection. His studies were made on a series of cases of chronic pharyngitis, complicated with enlarged tonsils. In all cases he states that the results were good. The local application of the fluid extract to the diseased mucous membrane showed a marked decrease in the contraction of the vessels and reduction of swelling with relief of the subjective symptoms. He states that patients readily accustom themselves to the bitter taste of this remedy, and even prefer the painting of the throat with the fluid extract to other forms of gargles or other local applications. Dr. Felsenburg thinks that perhaps a similar use of this remedy in the case of disease of other mucous membrane might lead to equally satisfactory results.

THE TREATMENT OF SCARLET FEVER BY MERCURIC IODIDE.

At the meeting of the Leeds and West Riding Medico-Chirurgical Society, held January 11, 1889, DR. PURDY (*British Medical Journal*, January 19, 1889) referred to Dr. Illingworth's original paper recommending this treatment and the support given to it by Dr. Clement Dukes, of Rugby. He had now tried it in more than fifty cases, during several epidemics, and was surprised at the results. In spite of the disease in one epidemic being of very severe character, there was only one fatal case, and that was dying when first seen. After giving the drug the temperature fell rapidly, and the patient seemed well in about three days, desquamation being very slight. The average period during which his cases were isolated was only eighteen days. He had seen no cases of infection from convalescents, and there were no lingering sequelæ. In one case a child was ill for five days, the diagnosis being uncertain; then the mother and several children sickened with evident scarlatina, two being very ill, with sloughs in the neck, but all made a good recovery, and were perfectly well before the first child had ceased peeling. The formula used was liq. hyd. perchlor., ℥i; pot. iodid., ℥ss; syrup, ad ℥viii. ½ ounce to be taken every one,

two, or three hours, according to circumstances. Several of his friends had tried this treatment, but with less good results, owing, he believed, to the treatment not having been begun early enough or to insufficient doses.

DR. CAMERON said it was hard to dogmatize on the treatment of scarlet fever. He had lately had eighty cases without a death, where no special medical treatment had been employed, boroglyceride being used to the throats as a routine practice. He thought desquamation generally depended on the extent of the rash. The age of the patient was an important element in prognosis; children under three years suffered most severely.

MR. MAYO had tried mercuric chloride in several cases, and in a few, where the throat was bad, thought the treatment had done good. Local treatment to the throat was used as well. He thought that in a great many cases the temperature fell on the third day, independently of treatment.

DR. CHURTON had seen very severe desquamation where there was hardly any rash. He pointed out the uncertainty in the estimation of the results of medicinal treatment.

MR. HICK had treated in the Leeds Fever Hospital fifty cases with mercuric iodide. Except that there were more cases of nephritis than usual, he could detect no special effect from the use of the drug. He had treated recently three series of eight cases each simultaneously, with iron, mercuric chloride, and a *placebo*, and, on the whole, the latter series did best. He had tried the treatment also in typhus, typhoid, and smallpox, but with no result.

DR. SWANN said scarlet fever was endemic in Batley, and he had seen a large number of cases. He had tried mercuric iodide, but with no special result.

DR. HOWARD thought medicinal treatment, as a rule, was not required. He applied counter-irritation by means of iodine to the throat externally, followed by an evaporating lotion, and the insufflation of iodoform and zinc oxide internally.

DR. JACOB referred to the large number of substances asserted, on the basis of long series of "cures," to be specifics for this disease, such as chlorine, pot. chlorate, ozonic ether, etc. Any results, to be conclusive, must extend over a series of years, and include a very large number of cases. As physician to the Leeds Fever Hospital he had seen a large number of cases, and lost faith in any specific treatment, but he thought the local treatment of faucial and nasal conditions very important for the comfort of the patient.

MR. RUMBOLL had, in a recent epidemic, treated thirty-six cases by this method; seven cases had nephritis; two died. He had recently treated a number more by other means, and he could see no special advantage in the treatment proposed. He recommended a spray of ferric chloride to the throat, which he administered by a special spatula, surmounted by a tube through which the spray-nozzle could be passed.

THE TREATMENT OF ASCITES AND GENERAL DROPSY WITH MILK DIET.

That ascites and general dropsy very often yield to the milk-diet treatment is a fact which had been recognized by the native physicians of India from a very remote age. Even in modern times many of the native physicians and quacks treat their dropsy cases in the same way, with at least partial success. They prohibit solid food of every kind, and all articles containing salt. They also prohibit the drinking of water, and make their patients take milk or curd in abundance. But there are a few particulars in connection with this treatment which they do not carefully attend to, and it is for this reason that they do not succeed in many cases.

This plan of treating ascites and general dropsy has received very little attention, the treatment generally recommended being that by watery purgatives, diuretics, and diaphoretics, paracentesis being recommended as a last resource in cases of great distention. In many cases purgatives, especially in hot climates, seem injurious; they appear to irritate the stomach and intestines of the patients and greatly interfere with digestion. Though an occasional purgative, by removing the accumulated fæces from the intestines and by inducing secretions from the intestinal glands, gives great relief to the general system during the course of treatment, it is held by some that a systematic use of purgative medicines, with a view to remove the dropsical effusions, does more harm than good. In many cases thus treated it is stated that dysentery supervenes; in some places it is looked upon as a fatal symptom in connection with ascites or general dropsy. In the *Lancet* for December 29, 1888, MR. K. P. CHOWDHOORY states that he has adopted the method of treatment first recommended by Dr. Richards, of treating ascites and general dropsy by the exclusive use of milk diet, and he has met with almost

uniform success. The very few cases of failure that have occurred in his experience have been those where organic mischief had proceeded too far to be consistent with the maintenance of life. He publishes details of two cases treated by tincture of iron, infusion of quassia, digitalis, squills, and oil of juniper, with milk as exclusive diet. In another case, a drachm of jalap-powder was ordered to start with, and milk constituted the diet, with cinchona, dilute sulphuric acid, and sulphate of iron. In this case also the digitalis, squills, and juniper-powders were given, and both cases were cured. It seems rather strange that, in view of the very extensive list of remedies employed in these cases, the author should attribute to the milk alone the credit of cure. No one of the various remedies employed can scarcely be claimed to be an inert substance. It is true that the author states that the medicines alone would not produce a cure if the milk diet is not given, and even if they are not confined solely to the milk recovery is not attained. The author lays stress on the fact that the milk shall be given in very small quantities, eight ounces being the largest amount allowed at any one time.

THE ACTION OF ICHTHYOL.

Dr. George Meyer has tested the action of ichthyol in articular rheumatism in sixteen different cases. The duration of the disease varied between two and twenty years. It was employed both internally and externally, and its use was continued for about three weeks. Internally it was administered in the form of solution or capsules, or pills, while externally it was painted on the surface in the form of alcoholic ethereal solution. In only two cases did its internal administration produce any distress, in these instances consisting of irritation of the throat, nausea, and eructations. These symptoms occurred in patients which previously had suffered from slight digestive disturbances. Relief of the pains of the chronic rheumatism was never observed, while two of the cases even claimed that their condition was aggravated during the use of the ichthyol.—*Therapeutische Monatshefte*, November, 1888.

A NEW METHOD OF OPHTHALMOSCOPY.

According to the Berlin correspondent of the *British Medical Journal* for January 12, 1889, Dr. Bellarminoff, of Moscow, recently demonstrated to the Berlin Medical Society a new method of ophthalmoscopy. The eye is first made insensible by cocaine; then a little plain glass is pressed against the cornea. Between the glass and the cornea a very fine zone of fluid is instantly formed. Thus, glass, fluid, and cornea being transformed into one refracting medium, the refracting power of the cornea is wholly eliminated. The eye is thus transformed into a highly hypermetropic one. By this method it is very easy to see the fundus of the eye, and four or five persons can examine the eye at the same time. The method is likely to be of great service for the instruction of students, but it is not probable that it will be of much use to practitioners.

THE ACTION OF VARIOUS OILS ON HEALTHY ANIMALS.

According to the Paris correspondent of the *British Medical Journal*, December 15, 1888, M. Daremberg has begun by making a series of experiments on healthy animals, with the view of ascertaining the effect of different oils on tuberculous animals. He found that different oils used as food, and cod-liver oil, may be taken for three months and a half without evil effects by guinea-pigs in daily doses of one cubic centimetre, and by rabbits in doses of three to four cubic centimetres. The oil is easily administered through a glass tube placed in the animal's mouth; the animal usually sucks the tube with avidity. M. Daremberg gave subcutaneous injections of a quarter, half, or one cubic centimetre of oil every day, every second day, or every four days, into the abdomen, the back, or the paws of guinea-pigs and rabbits. The oil and instruments were previously sterilized. In no case were abscesses observed in the animals, but the injections produced the following results: Nearly all the guinea-pigs died after a varying interval of time; they all presented a similar lesion,—namely, fatty perisplenitis. Around the spleen there was a collection of yellowish fat, soluble in ether. The spleen adhered to the kidney and stomach; the stomach adhered to the liver and the parietal peritoneum. Fatty patches were detected on the liver; in some cases the biliary vesicle was completely surrounded by these yellowish masses. In every case there was a yellowish track under the peritoneum, below the costal insertions of the diaphragm on the left, and sometimes on the right side. In no case did the liver adhere to the parietal

peritoneum on the right side of the abdomen. The fatty infiltration almost entirely disappeared when the injections were suspended for a certain time. But the adhesions persisted, as M. Daremberg ascertained by examining several animals which were killed. He found these adhesions: First, in a guinea-pig to which eight and a half cubic centimetres of white cod-liver oil had been given in eighteen days, and which was killed forty-two days after the last injection. Secondly, in a guinea-pig to which seven cubic centimetres of pale cod-liver oil had been given in sixteen days, and which was killed fifty-two days after the last injection. Thirdly, in a guinea-pig to which eight cubic centimetres of brown cod-liver oil had been given in sixteen days, and which was killed sixteen days after the last injection. Fourthly, in a guinea-pig to which one cubic centimetre of oleic acid (chemically pure) had been given, and which was killed forty-three days after the injection. The amount of oil required to cause death in guinea-pigs varied considerably. One guinea-pig died eight days after receiving four cubic centimetres of white cod-liver oil; another died twenty-three days after two cubic centimetres and a half; a third, which received eighteen cubic centimetres in thirty-six days, survived; it was killed thirty days after the last injection, and was found to present the adhesions in the peritoneum above described. One cubic centimetre of pale cod-liver oil killed one rabbit in six days; five cubic centimetres killed another in thirteen days; twenty-five cubic centimetres killed a third in fifty-two days. Two rabbits, to which six cubic centimetres and a half of brown cod-liver oil had been administered, died in fifteen days; one to which six cubic centimetres had been given died in twenty-five days; another died, after receiving nine cubic centimetres, in thirty-six days; another, after two cubic centimetres and a half, in six days; another, after four cubic centimetres, in eleven days; another, after six cubic centimetres and a half, in twenty-two days; another, after seven cubic centimetres and a half, in twelve days; another, after four cubic centimetres and a half, in thirty-seven days; and another, after twelve cubic centimetres, in twenty-eight days. A guinea-pig, to which one cubic centimetre of oleic acid, as usually sold, was given, died the same day; another, which received one cubic centimetre and a quarter, died in three days; two others, which received one cubic centimetre, died in four days; another died in fifteen days, after receiving one cubic centimetre; another in seventeen days, after one cubic centimetre and a quarter; another in nine days, after one cubic centimetre; another in eight days, after four cubic centimetres; and another in six days, after four cubic centimetres. One guinea-pig died in seven days, after receiving one cubic centimetre of olive oil; another died in thirteen days, after receiving one cubic centimetre and a half of colza oil; another in thirty-one days, after four cubic centimetres of cotton oil. One died in forty-seven days, after receiving six cubic centimetres of oil of *Fagus sylvatica;* and another died after receiving three-quarters of a cubic centimetre of crude petroleum oil. In the case of rabbits the effects of subcutaneous injections of oil were considerably less severe. After receiving half a cubic centimetre of oil every day for a month these animals were killed. They all presented the fatty lesions and adhesions observed in the guinea-pigs, but in a minor degree; and they appeared to be perfectly healthy. In every case there were oily tracks in the peritoneum, around the liver, kidney, stomach, spleen, and costal insertions of the diaphragm, but there were no adhesions in these organs. The stomach alone was attached by somewhat loose bands to the parietal peritoneum. A few patches of fat were found on the liver and spleen. The fatty infiltration of the large omentum gave it the aspect of a loosely-woven net. The rabbits which received similar doses of crude petroleum oil presented abscesses at the spots where the inoculations were made, and the same fatty lesions, rendered more apparent by the black color of the oily tracks. Some black spots were also noticed on the lungs. Most of these animals were in good condition at the time of their death. Several of them increased in weight during the period in which the experiments were made.

THE TREATMENT OF DIABETIC COMA.

The production of diabetic coma has been referred to the development of various complicated organic acids in the economy, and, if the supposition as to its mode of production is correct, the administration of alkalies is evidently indicated. Cases are on record in which the intravenous injection of a three per cent. solution of sodium carbon has proved successful. Dr. Hesse reports in the *Berlin. Klinische Wochenschr.*, No. 19, 1888, a case of a man, 42 years of age, with 4.1 per cent. sugar in his urine, in whom, in one hour

after the onset of coma, a little over 8 ounces of four per cent. solution of carbonate of sodium were injected into the veins; the coma gradually gave way to quiet sleep, and the patient soon awoke in a perfectly conscious condition. On the following afternoon somnolence again set in, and the patient died before a second injection could be administered. Although in this case it does not appear to have saved life, yet its favorable influence seems to be beyond doubt, since spontaneous disappearance of diabetic coma never occurs.

Reviews.

STUDIES FROM THE LABORATORY OF PHYSIOLOGICAL CHEMISTRY, SHEFFIELD SCIENTIFIC SCHOOL OF YALE UNIVERSITY, FOR THE YEARS 1887–1888. Volume III. Edited by R. H. Chittenden, Ph.D., Professor of Physiological Chemistry.

New Haven: Tuttle, Morehouse & Taylor, Printers.

Until very recently the abstract sciences, which underlie medicine, have been so excluded from the United States that the appearance of any new volume which is at all creditable to our civilization still sends a thrill of pleasure through the nervous system of those who have been accustomed to mourn the barrenness of Israel. We, therefore, hail with much delight volume third of the studies from the Laboratory of Physiological Chemistry of the Sheffield Scientific School, published under the auspices of Professor R. H. Chittenden, and wonder somewhat that this series has not received the praise or gained the notoriety which it deserves.

The present volume, which contains about one hundred and fifty pages, and is a handsome specimen of American book manufacture, is composed in all of nine original papers, of which five are of special interest to the therapeutist. The first of these papers by Professor Chittenden and Dr. Alexander Lambert considers the physiological action of the uranium salts, the conclusion being reached that uranium is an irritant poison of remarkably slow action, producing, when ingested in sufficient amount, gastro-intestinal irritation, with a very pronounced acute parenchymatous nephritis.

Urethan, paraldehyde, antipyrin, and antifebrin are considered by Professor Chittenden, on the bases of experiments made by Messrs. N. P. Washburn, J. E. Dockendorff, H. F. Adams, and H. C. Taylor, to have a quick and very distinct influence upon the excretion of nitrogen, and when in large doses, also of phosphorus and sulphur. So the conclusion is that when urethan is taken in small quantities it exerts an inhibitory influence on proteid metabolism, while after larger doses the inhibitory action of the drug on proteid metabolism is still more pronounced. Paraldehyde was found not to have any distinct action on tissue-waste; but antipyrin had a decided inhibitory action on the proteid metabolism of the healthy human being, which is in opposition to the results obtained by Dr. Kumagawa (*Virchow's Archiv.* Band cxiii.). Acetanilide, or antifebrin, in the doses employed, appeared to increase proteid metabolism.

Professor Chittenden and Dr. Stewart found that antipyrin, antifebrin, and urethan have very little or no influence upon the amylolytic action of the ferment of human saliva; but that paraldehyde has a strong inhibitory action, and that the thallin sulphate, if present in very minute amount, stimulates the action of the ferment, although a .2 per cent. solution almost entirely stops such action. It was also shown that caffeine and theine have very little influence upon the proteolytic action of pepsin-hydrochloric acid; that antipyrin and antifebrin have a decided inhibitory influence; that urethan has a slight retarding action, and paraldehyde and thallin sulphate a very decided stimulating action.

In a few experiments Professor Chittenden and J. A. Blake found that small doses of antimonious oxide, long continued, tend to increase the body weight, and particularly the weight of the liver. The increase in liver weight is accompanied by an increased percentage of fat and a slight increase of liver glycogen; while, on the other hand, from corresponding doses of arsenious oxide, the results would indicate a diminution in body weight, liver weight, and also liver fat.

Professor Chittenden and Mr. Charles Norris, Jr., have made some experiments on nickel and cobalt. They find that free soluble salts are decidedly toxic, but slow in action, and requiring large amounts to produce fatal results. They both act in disturbing the alimentary canal, and especially by depressing the heart. A portion of the administered doses was quickly absorbed and quickly eliminated by the kidneys; but a large part of the dose passed directly through the alimentary canal. A rather remarkable fact was that the spinal cord and brain, in the majority of experiments, stood first in their power of picking up and retaining nickel and cobalt.

A Text-Book of Human Physiology. By Austin Flint, M.D., LL D., Professor of Physiology and Physiological Anatomy in the Bellevue Hospital Medical College, New York. Fourth edition. New York: D. Appleton & Co., 1888.

To those to whom the mention of Flint's "Physiology" recalls his first work published in five volumes, or even the bulky condensation which constituted the second edition, the present edition of his work will appear as a new book. An examination of the work warrants the author's claim that it is entirely rewritten. The long historical discussions, which were of but little profit, and which occupied so large a part of the early editions of this work, have been wisely omitted, together with descriptions of apparatus and methods, which can but little enhance the value of a text-book. With the exception of chemical questions, which can hardly be regarded as the strongest part of his book, Dr. Flint's new edition appears to be thoroughly up to the times. Well-established facts in physiology are concisely stated in such a form that they can be easily comprehended by students. The work is handsomely illustrated with three hundred and sixteen diagrams, while its typography, paper, and so on, leave little to be desired.

Correspondence.

CINCINNATI.

(From an Occasional Correspondent.)

Muscular atrophy due to lead-poisoning was an interesting case shown by Dr. Eichberg to the Cincinnati Medical Society. The man worked at stone-cutting, and used much putty, from which he was poisoned by the lead it contained. This was followed by wrist-drop and great atrophy of the deltoid. One could lay the finger between the ulna and radius. He worked up to eight weeks ago, but has been unable to work since that time. The doctor thought that on account of the rapid changes which were in progress there had been some change in the gray matter of the spinal cord, probably in the anterior horns.

The recent epidemic of yellow fever in Jacksonville was the subject of a report by Dr. L. C. Carr at the Cincinnati Medical Society. Dr. Carr was introduced by the President in a neat speech, in which he welcomed the doctor back in safety from the field of action at Jacksonville, where he had well earned honors not only for himself, but also for the profession to which he belonged.

Dr. Carr said that his observations led him to the belief that if the specific poison of yellow fever be transferred to a locality it will spread if there is sufficient heat and moisture, and that one of the most favorable conditions to its spread is a state of panic. The period of incubation he believes to be from twelve hours to five days. If asked, Is yellow fever contagious? he would answer, No, not in the common acceptation of the term. Camp Perry was the highest and most beautiful spot in Florida. No single case developed in Camp Perry proper. There were at all times one hundred employés, all unacclimated and exposed continuously to the yellow fever. Sand Hills Hospital did not develop a single case, except where the nurses went into Jacksonville for a short time. One of these remained only twenty minutes and contracted the yellow fever. The doctor stated it as his belief that, while a person might convey yellow-fever poison from one point to another, still, unless it finds sufficient heat and moisture, and what else it may need, it cannot develop yellow fever. He firmly believed that yellow fever had been in North Florida since last January. They have had "dandy" fever, "society" fever, and malignant bilious fever all this time, with a mortality of six per cent., which is in excess of the mortality from these diseases. The doctor's conversion to the germ theory in the origin of yellow fever was thorough and complete. There is no doubt that yellow fever attacks first the intestinal tract, and travels through the stomach, liver, spleen, and kidneys. He always found the inner coat of the stomach blackened on autopsies. He was in bed five times while in Jacksonville. The first time was after fifteen days, and he thought it malarial poisoning. He was attacked with black stools, which were quite frequent, and he was over it in a day. He thinks the bilious diarrhœa saved him from the yellow fever. Gibier took him to the hospital, and showed him what he claimed as the germ of the yellow fever. Gibier claims that cold will not kill the yellow fever, but that a temperature of 110° will kill it. Dr. Carr found no trouble in the lungs in any autopsy that he made. He found the spleen normal, the heart showed signs of fatty degeneration, the liver gave the boxwood appearance, and the pelvis of the kidney was solid in every case. The bladder was empty, excepting some precipitated albumen. The temperature in one case

reached 111°, and still the patient recovered. If the albumen in the urine is white, it is a bad symptom. If the albumen is gray, tinged with bile, it is more favorable. The doctor attended one hundred and seventy-two cases, and in no case was albumen absent from the urine. In one case it did not appear till the fifteenth day, and in some it appeared before the chill. The early appearance of the albumen is an unfavorable symptom, and only one case recovered in which it appeared on the first day.

Treatment of yellow fever he found to be necessarily empirical. We do not know just what we are treating, but if we can carry the patient through the fever, we stand a chance of saving him. The doctor's choice method of treatment was to give in the onset of the disease 4 ounces of castor oil and a few drops of turpentine, and cover the patient with a blanket. He used a great deal of antifebrin, —4- or 5-grain doses every few hours. This kept up a gentle sweat, and kept the fever under control. He gave as a drink a mixture of half a grain of bichloride of mercury, two drachms of bicarbonate of sodium, in water. He also gave the carbonated water. If there are kidney complications, he gives the diuretic which seems to be indicated. If there is no kidney complication, and the per cent. of albumen not over fifty, he gives no diuretic. At the fifth day the battle commences with the patient, and it is then that the services of trusty nurses are so in demand. The craving for drink which the patient endures is beyond expression. The patient will drink if certain that it will kill him, and he demands the closest watching. The pulse is not consistent with the temperature, and generally runs about 100. He did not use quinine unless there was malarial tendency. No negro died of yellow fever. One was thought to have died of this complaint, but the autopsy showed this a mistake. This class of people suffered very much from that phase of the disease locally known as "rational" fever,—that is, when they asked for rations. The popular treatment among the laity is to sweat the patient; and they carry it to a terrible excess. He had seen patients sweating at a temperature of 94°, but he did not see it long. Dr. Broadus, of St. Louis, introduced an excellent method of stopping this sweating. He would strip the patient of all clothing, take a palm-leaf fan, and quietly and steadily fan the patient. The sweating would stop, the temperature begin to rise, and steadily improve till about normal again. This worked like a charm, and many lives were saved by it. Dr. Carr promised at some future date to give his ideas more fully on the subject, especially with reference to the management of the finances and care of the people, than he had been able to do on this short notice.

As to the disease being more readily contracted in the night-time, he said: "Travellers landing on the coast of Mexico at Vera Cruz, if they landed at night, and passed through the city when yellow fever was prevalent, were almost certain to contract the disease. During the epidemic at Jacksonville about forty persons made it a practice to go to Pabloe Beach on the four o'clock boat, and remain there overnight, returning in the morning for business. Not one of these forty who kept up the practice acquired the disease. Several who discontinued it and slept in town contracted yellow fever. The general opinion is that the vomit is blood. The question as to whether the disease returns is still in doubt. He had one patient who claimed to have had the fever in 1878, but he had not yet been able to communicate with the doctor who treated him. He could give very little information concerning the nature of the germ, but it looked like a yeast spore. The nurse Ansel Wood, who went there from Cincinnati and died, the doctor thought died from a strangulated hernia, which was overlooked."

The paper was discussed by Dr. Comegys, who dwelt on the kidney complications, and Dr. Norton, who had attended two cases of yellow fever brought to this city in 1848.

BERLIN.

(From our Special Correspondent.)

At the last meeting of the Berlin Medical Society, Professor Küster, the surgical director of the Augusta Hospital, delivered an address on the "Treatment of Pleural Empyema," in which he brought forward a method of treatment based on his own experience, which differs considerably from the therapeutic measures of treating this disease at present commonly employed in Germany. At the fifth meeting of the Congress for Internal Medicine, held in 1886, in Wiesbaden, the question as to the treatment of empyema provoked considerable discussion, in which the most eminent German clinicians took part, the views which Professor Fraentzel then advocated on the subject being universally accepted as outlining the general plan of

treatment, and the principles of treatment which he then formulated may be regarded as representing the method of treatment universally followed in Germany at that time. His method may be stated in a few words as follows:

Fraentzel first started with the assumption that under no consideration should a case of tubercular empyema be subjected to operative measures, with the single exception that in desperate cases puncture may be performed to relieve immediate danger of suffocation. In other cases he advocated puncture, and when repeated operations did not serve to produce a cure, he then recommended simple partial resection of a rib in the front part of the thorax and removal of the pus by washing out the pleural cavity. If this did not succeed, he then recommended the introduction of a catheter in order to break up adhesions, so as to permit of exit of the pus from the pleural cavity. Should the temperature rise to any great extent, he then recommended the performance of a second incision in the posterior wall of the thorax, which, as in the case of the anterior incision, should not be located too far down in the thorax. It is only very recently that certain clinicians, among whom Kussmaul and Naunyn may be mentioned, have recommended a much more radical operative procedure. Professor Küster, on the other hand, advocates the treatment of purulent pleural exudation based on quite other principles, and recommends a method which he has defended since 1873, previous to the time when Estlander, who is generally acknowledged to have the priority in this respect, published his method of surgical treatment of pleural empyema. The principles on which he bases his mode of procedure are the following: In the thoracic cavity the bony thorax forms one wall; between the ribs are stretched the soft parts which are capable of a certain degree of movement; while the other wall of the pleural cavity consists partly of the lungs and partly of the pericardium, if the empyema is on the left side, and partly of the diaphragm. The inner wall is thus formed of extensible, or, at least, movable organs. If, now, it is imagined that the lungs are so compressed as to admit of no further displacement, it is evident that a reduction of the cavity may be possible either through ascent of the diaphragm or a depression of the intercostal tissues, though it is evident that a complete obliteration of the cavity can never take place in this way.

It is evident, then, that, to accomplish cure by obliteration of the pleural cavity, attention must, in the first place, be directed towards regaining the expansibility of the lungs, and that this is only possible when the compression of the lungs has not been of long duration. The indications for therapeutic interference are, therefore, self-evident. Operative interference is called for at the earliest moment possible, and the opening should be so located that the pus may be completely and spontaneously evacuated In other words, the opening into the pleural cavity must be at its most dependent point, and so treated that the sides of the incision do not fall together and so interfere with the free exit of the pus. Professor Küster bases his method of treatment on the above fundamental principle, and has met with the most surprising results. His studies include notes of one hundred and nine cases, thus constituting the most extensive experiments yet published by any single physician. They differ further from all other published statistics in that they, without exception, include both the successful and unsuccessful cases. Thus, for example, they include a very large number (thirty-two) of cases of tubercular empyema which were almost dying when brought upon the operating-table, and, in addition, a number of cases complicated with other diseases, which were almost to be regarded as inevitably fatal. Taking into consideration the nature of his cases, Professor Küster's results were extremely favorable. Sixty cases were completely cured (fifty-five per cent.); seventeen cases were not cured (sixteen per cent.); thirty-two cases died (twenty-nine per cent.). In the cases which were cured are only included those which either did not report subsequent to their discharge, or in which subsequent examination proved not only that the cavity had been completely obliterated, but that the external fistula was fully healed. Those cases were regarded as cured which were discharged with a thoracic fistula, provided they did not subsequently come under treatment, since in all probability cases belonging to this category were subsequently healed. Professor Küster's cases might be divided into the following six groups:

First.—Uncomplicated empyema,—that is, pure traumatic empyema; those cases where the empyema followed recovery from infectious disease; cases of empyema following pneumonia, measles, and scarlet fever are included in this group, and are the cases which in the clearest manner demonstrate the value

of the operation. This group comprised thirty-nine cases, of which thirty-four were completely cured. Four cases died, of which one died from carbolic acid poisoning, an accident which, in the present method of antiseptic treatment, could scarcely occur. One case was discharged uncured, and no information could be obtained as to his subsequent history.

Second.—Cases of chronic empyema,—that is, cases in which suppuration had lasted longer than six weeks. Of the seventeen cases belonging to this group, eleven were cured, three died, and three were discharged uncured.

Third.—Cases which had been previously unsuccessfully treated, in which a single incision had been made resulting in thoracic fistula of several months' duration. Further, cases are included in this group in which, without any operative treatment, either an external or a bronchial fistula had formed. Of the fifteen cases belonging to this group, eight were healed, six died, one remained unhealed.

Fourth.—Cases with pulmonary gangrene, consequently cases which ordinarily are regarded as quite unfavorable for treatment. Of the three cases belonging to this group, two died, one was cured. Another case which is included among the tubercular cases partly belongs to this group, since in opening the pleura a portion of pulmonary tissue as large as the fist was extruded and removed. This case also was healed.

Fifth.—Cases complicated with diseases which were themselves to be regarded as almost invariably fatal. Cancer and basilar meningitis, three cases, comprise this group, and all died.

Sixth.—Tubercular empyema. Of thirty-two cases forming this group, six were healed, fourteen died, twelve remained unhealed. The fatal cases, with one exception, are not to be attributed to the operation, but the patients died after long treatment in the hospital from progressive tuberculosis and from amyloid degeneration of the kidneys. That, however, six cases were cured is a remarkable result, since the cases of cure of tubercular empyema are but rarely met with; and further, the cases which come under the treatment of the surgeon, are almost always in the last stages. Even if no single case had been cured, Professor Küster regarded it as a satisfactory result, in that the condition of the patients was greatly improved, and, since they were enabled to sustain the presence of a thoracic fistula, their sufferings were greatly relieved. Professor Küster's method may, therefore, be formulated as follows: Operate as soon as possible, through the resection of one or more ribs, making the opening in the most dependent portion of the pleural sac, so as to permit the ready and constant evacuation of the purulent contents of the pleura.

BERLIN.

(From an Occasional Correspondent.)

A Unique Case of Acromegaly—A Girl with Two Hundred and Fifty Cherry-Stones in her Intestines—New Observations with Sozoiodol—Myrtol as a Disinfectant of the Air-Passages—The Drawbacks of Creolin—Results of Extirpation of the Stirrup-Bone—Gran Canaria—A Cure for Red Hands—A Case of Leprosy—A New Suspensory.

The immense crowd of physicians and surgeons who thronged the hall of the Berliner Medicinische Gesellschaft at its meeting of January 16 indicated that an event or demonstration of unusual interest was to take place. Professor Virchow presented on the living subject the extremely rare affection known as acromegaly (τὸ ἄκρον, the extremity; μεγάλος, large), and made it the subject of a highly interesting essay. Your correspondent has stenographed the entire discussion, and begs to present its essential features to the readers of the GAZETTE.

Acromegaly, as the name indicates, is an excessive growth of the extremities, in which the head usually participates, and the affection is to be regarded as a partial giant-growth. Professor Barry, of Paris, has given the affection its present name, though a few single cases have been described in earlier times. Professor Virchow admitted that he had never seen similar dimensions on any human being. Before entering into the details of that remarkable case, Professor Virchow briefly alluded to some similar cases coming under his observation. He showed the skeleton and various casts of extremities belonging to a man who died in the Royal Charité last year. Both the skeleton and the casts showed enormous dimensions, which, however, as was soon to be seen, did not even approach those of Virchow's patient. Various observers, particularly Professor Freund, of Strasburg, believe in a certain relation between this affection and the sexual apparatus, all the more as the most pronounced phenomena of acromegaly appear to coincide with the period of puberty.

Virchow himself doubts the existence of such relations. The daughter of the man whose skeleton was shown showed the same anomalous growth, though only 11 years of age. There seemed, however, to be an hereditary element in the affection, as suggested by the above cases of father and daughter and two others which occurred in Heidelberg and were described by Professor Friedreich.

The patient before the Society is an exceedingly robust and large man, perfectly healthy, and father of six children. He cannot state at what period of life acromegalous symptoms began to develop in him, but he remembers that when quite a little boy his teacher had once remarked that he would surely be enlisted in the Prussian guards. His lifting capacity is truly enormous, for he lifts with ease and pleasure EIGHT HUNDRED POUNDS. The head of the man shows gigantic proportions, in all directions defying all his hitherto collected anthropological experience. The skull of the giant measures in circumference 65.5 c.m., in length 22.9 c.m., and in width 16.8 c.m. These figures are far in excess of those taken from other gigantic individuals, such as Murphy and Winkelmeyer, the two well-known giants of Castan's Panopticum (in Berlin), and a Prussian guardsman. While the height of Murphy's body was 7.1, of Winkelmeyer 6.3, and of the guardsman 6.7 times the length of the foot, the comparative index in this instance was only 5.8. His absolute height is 183.8 c.m. The pathological process in acromegaly is not only confined to the bones, but extends also over the soft parts. The view that cartilages and adipose tissue are principal factors in this condition is erroneous. The affection has a certain similarity with myxœdema, but differs from it in the fact that in the latter the bones are never involved. Acromegaly cannot possibly be confounded with leontiasis ossea, as the facial bones do not assume in the former affection the appearances characteristic of the latter. The distinction between acromegaly and osteitis deformans (described by Sir James Paget) lies in the degeneration of bones symptomatic of the latter disorder.

To add to the above remarkable, if not unique, case the history of another singular case, your correspondent quotes the following statement from the *Berliner Tageblatt* of January 17: A girl, 22 years of age, died suddenly in the Friedrichshain City Hospital of Berlin, and was subjected to a post-mortem examination. The autopsy revealed a truly marvellous and almost incredible fact: the lower portion of the small intestines contained no less than two hundred and fifty cherry-stones and three plum-kernels. Authentic medical authority vouches for the truth of this remarkable statement.

It is a noteworthy and fortunate fact that the incessant and morbid chase after new remedies which is characteristic of the present therapeutical era has, momentarily at least, stopped, a more accurate examination of the recent pharmacal acquisitions having taken its place. Quite notable in that direction are the extended observations of Dr. Nitschmann, of Erfurt, on the medicinal virtues of sozoiodol. This new drug was first introduced by Trommsdorf, a chemist of Erfurt, and recommended by Professor Lassar, the well-known Berlin dermatologist, as a local application of great energy in parasitic skin-affections. Fritsche obtained very satisfactory results with sozoiodol in nasal and pharyngeal disorders, using it partly alone and partly combined with sugar of milk. Nitschmann himself has used the new remedy successfully on mucous membranes with the brush or in douche form in solutions of five to seven per cent. Langgaard, the assistant of Professor Liebreich, declared sozoiodol as a non-poisonous drug which may be applied even to the denuded skin without danger of intoxication. In spite of the powerful antiseptic virtues of sozoiodol Nitschmann does not recommend its use as a simple antiseptic in bruises and lacerations on account of its being more expensive than other equally prompt antiseptic agents. In severe and putrescent injuries, however, such as are particularly frequent in factories and machine-shops, sozoiodol presents distinct advantages. The drug combines astringent with disinfectant properties, and is, therefore, particularly eligible in cut-wounds produced by a dirty or rusty knife, in which the *prima intentio* has failed, in bruises produced by toothed wheels or instruments, in burns caused by liquid metals, in superficial burns following an explosion, and in chronic ulcers of the leg. Nitschmann formerly used in granulations iodoform, and applied nitrate of silver if the granulations became too luxuriant, followed again by the application of iodoform to counteract too severe a cauterization. This treatment, besides producing black margins of the wound and an unpleasant odor, had the disadvantages that the patient had to be examined daily, an exigency which, particularly in the country, is next to impossible. In all such

cases an ointment prepared from sozoiodol is a happy medium between the two applications mentioned above, and gives excellent results. The wound is easily kept clean, and presents a healthy, red color, without luxuriant granulations. Nitschmann has by the application of a sozoiodol ointment healed extensive wounds in from four to five days, which, by the old treatment required two weeks or more to heal. In two burns subsequent to an explosion, in which the injuries presented almost identical features, Nitschmann treated one case with iodoform and the other with sozoiodol, and found that the healing process under the influence of the latter application proceeded twice as fast as under the former. His formula for the sozoiodol ointment is:

℞ Sozoiodol, ʒx;
Lanolin, ʒi. M.
F. ungt.

Another field of great usefulness for sozoiodol are chronic catarrhs of mucous membranes. A watery solution of five per cent. of sozoiodol zinc painted over the parts every two hours is a safe and prompt application in acute pharyngeal catarrh or acute stomatitis. If the application proves too burning, pure water may be applied after the painting. The drug proved likewise valuable in many cases of acute conjunctivitis appearing during an epidemic of measles at Erfurt. After the application (like after the use of $ZnSO_4$), however, cold water washes should be employed for fifteen minutes. In purulent conjunctivitis and blennorrhœa neonatorum sozoiodol sodium may be advantageously substituted for sozoiodol zinc as a less painful application. Nitschmann's formula for these cases is:

℞ Sozoiodol sodium, gr. xxx;
Aquæ, fʒi. S.

In gonorrhœal urethritis the application of sozoiodol zinc* is quite useful, on account of its combining astringent with disinfectant properties. An important and successful field for the application of sozoiodol is vaginitis. True, in cases where daily examinations and applications can be made, the use of the speculum and direct cauterization with acetum pyrolignosum or nitrate of silver give the best results. But in cases where a daily treatment is impossible, a tampon saturated with a sozoiodol sodium salve (1 to 10) is an application equally grateful as useful. In catarrh of the cervix (Emmet's ectropium) the drug, applied in form of the powder has given highly satisfactory results. The drug being but little soluble when applied as a powder to the cervical region, forms a rather permanent, and therefore very effective, application. The powder is best blown on the part† by means of a glass tube, at one end of which a rubber mouth-piece is fastened. In endometritis a concentrated solution (seven per cent.) applied by means of Braun's syringe has in the hands of Nitschmann proved very successful. It is, however, indicated to make an application of water immediately after the cauterization, in order to prevent the entrance of the drug into the peritoneal cavity through the tubes in case of intervening cramps. In vaginismus pruritus a five per cent. solution of sozoiodol zinc is useful. In rheumatism sozoiodol lithium has been used, but its degree of usefulness has not yet been ascertained.

Of equal interest as Nitschmann's observations with sozoiodol are the clinical researches of Professor Eichhorst, the widely-known therapeutist of Zürich, made with another new remedy,—viz., myrtol,—which is recommended as a disinfectant of the air-passages. Myrtol is a perfectly clear fluid, and represents that constituent of oil of myrrh which boils at 160° to 170° C. Linderm is the only clinician who has instituted any detailed trials with myrtol. Eichhorst himself was first to apply it in gangrene of the lungs. The results which he obtained were so surprisingly favorable that he has used the drug in numerous cases, and is now convinced that as a disinfectant of the air-passages myrtol has not its equal. The drug is best given in gelatin capsules (à .15, prepared in Paris, or by Pohl, of Schönbaum-Danzig). If a capsule is crushed, the peculiar odor clings to the room for a long time, and if a capsule is swallowed, the breath emanates the characteristic odor for many hours, and often for a couple of days. In putrid bronchitis and pneumonic gangrene two to three capsules should be taken every two hours to deodorize and disinfect the parts. The effect is rapid, and a few capsules suffice to remove the bad odor, and often to produce a permanent improvement. The drug is, however, apt to cause a temporary loss of appetite. Myrtol has also been tried against tuberculosis, but the drug has proved utterly useless against the bacillus tuberculosis.

* In a two per cent. solution.

† Through the speculum.

Les extremes se touchent. While extolling the virtues of some new remedies, it will not be amiss to call attention to the drawbacks and disadvantages of another new drug, which of late has become quite popular,—viz., creolin. Although the disinfectant properties of creolin have now been definitely proved, the drug has certain disadvantages which contraindicate its use for certain purposes. The solution of creolin is wholly opaque, hence it cannot well be used for the basin, in which the instruments are placed before an operation, as it renders their finding difficult. Another disadvantage is that it renders everything with which it comes in contact so soapy that it materially interferes with the firm hold on instruments and parts to be operated upon. That creolin is by no means a harmless agent, but can give rise to serious intoxication, has been amply proved by the publications of Rosin and Cramer.

A very interesting case from a physiological point of view recently came under the observation of Professor Berthold. A young woman suffered from an otorrhœa, as result of which the stirrup-bone of the ear had to be removed on the right side. The left ear did not show any hearing properties at all. After the operation, during which no labyrinth-water came away, serious disturbances of balance appeared, such as have been noted in pigeons in which the semicircular canals were injured. The perforation of the drum membrane was mechanically closed, and the woman did not hear when spoken to from the neighborhood, but she could hear whispering from a distance of fifteen feet. This singular phenomenon is obviously of interest from both a physiological and a surgical point of view, though it may not be easy to find an explanation for it.

Gran Canaria, with the capital Las Palmas, on the Canary Islands, is enjoying the distinction of attracting the consumptives from all parts of the continent, and will soon contest with Davos and Denver City as a resort for phthisical patients. The air in the Palm City is dry and the days uniformly sunny. The temperature is nearly constant at 26.1° C. from November up to May, the daily medium variation being only 5° C. Besides, rain is almost unknown in that region; in seven months, for instance, it rained only once, and that at night. The town is pretty and living is cheap, good hotels giving full board at the rate of two dollars and a half per day. These advantages render Las Palmas the ideal sanatorium of consumptives.

The question, How can the physician, in spite of daily contact with the erosive effect of antiseptic and other chemicals, preserve a white and smooth hand?—a question of considerable interest to all disciples of Æsculapius,—has been satisfactorily answered by Dr. G. Meyer, of Berlin, according to a method devised by Professor Liebreich. The hand is to be washed with an easy lathering centrifugal soap, and to be dried very carefully. Then a small quantity of lanolin is rubbed into the hand. Liebreich's formulæ are:

1. ℞ Lanolin, ʒii;
Vanill., gr. iss;
Ol. rosar., gtt. i.

2. ℞ Lanolin, ʒii;
Paraff. liquid., ʒvss;
Vanill., gr. iss;
Ol. rosar., gtt. i.

The salve is best kept in a little tin box (such as is used for colors) from which the contents can be squeezed out at any time. The salve can easily be removed from linen soiled with it. The cause of the action of the ointment is the absorption of all water left from the washing and an absolute drying of the hand. Besides, the hand becomes covered with an impermeable fatty coating, which prevents the tearing or fissuring of the cuticle. (Lanolin is also used to remove wrinkles from the face.)

A case of leprosy, the second ever seen in Berlin, has attracted a good deal of attention from the Berlin profession. The patient, a young man of 26, hails from Galveston, Texas, and was sent here for treatment. He is at present under the treatment of Professor Lsasar, who, without having produced anything approaching a cure, seems, nevertheless, to have improved the condition of the patient.

Your correspondent saw a suspensory recently in a Berlin hospital, which he regarded as a decided improvement over the old form. The principal feature of innovation was that the fixation of the suspensory was obtained by bands worn around the shoulders, on the plan of suspenders, which prevents the slipping of the suspensory.

A new and useful order has recently been published by the government forbidding circumcision as a religious rite to be executed by other than regular practitioners of medicine. Hitherto, as is well known, this operation has been always executed by Hebrew officials who had no medical education.

PARIS.

(From our Special Correspondent.)

In the speculations of contemporary therapeutists *strophanthus* still holds a foremost position. The complex effects of the drug indicate a plurality of chemical principles, and last month M. Catillon, one of the strophanthus faithful, announced that he had discovered a distinct principle, appearing to be the diuretic element of the drug. The substance in question contains nitrogen, is not poisonous, and is probably not an alkaloid, as it forms with lime a soluble combination from which it is separated by muriatic acid. That it is distinct from strophanthine—one might almost say strophanthines—is shown by the mode of extraction, which consists in exhausting the seeds with strong alcohol to extract strophanthine, and macerating the residue with lime and water, filtering, separating the excess of lime with carbonic acid, and evaporating in vacuo. The product is soluble in water and in alcohol weaker than seventy degrees, and is considered an amide by M. Catillon. Experiments made on himself and rabbits proved the substance to possess powerful diuretic properties. The discovery, although not of capital importance, is of some interest, as it brings out some tangible facts, while the question of strophanthus and strophanthines still remains perplexing. The active principles appear to be for the present abandoned by general consent, but considerable diversity of opinion is still manifested by practitioners respecting strophanthus itself. Dr. Germain Sée having spoken ill of the African plant, Dr. Bucquoy, on January 8, read at the Academy of Medicine a warm defence of it, much lauding strophanthus in cardiac effections, and relating quite a series of cases successfully treated with Galenic preparations of the seed. Next, on the 15th, before the same learned assembly, Dr. Dujardin-Beaumetz spoke rather favorably of strophanthus, adding, however, that he has obtained with *extract of oleander* results perfectly identical with those of strophanthus, the only difference being that larger doses of oleander are necessary. And, lastly, at the same meeting, Dr. Germain Sée began, in answer to the foregoing, to read a grand communication, which will only be concluded during the sitting of January 22. So it appears French therapeutists are not yet near agreeing about strophanthus.

Muriatic acid poisonings are not unfrequent, but it is seldom their effects are observed as carefully and under such favorable conditions as the following. The accident occurred some time last May, but it gave rise to painstaking investigations and experiments on animals, which are only now related by Dr. Letulle, of the Tenon Hospital, and his interne, M. H. Vaquez. The patient, a man aged 58, while tipsy, swallowed by mistake a whole tumblerful of commercial spirit of salt. A physician, called in at once, gave emetics, which acted freely and greatly relieved the patient, who, two days after the accident, was transferred to the Tenon Hospital. There it was observed the man appeared to suffer but little from the stomach, and chiefly from the lungs. A few hours after his admittance, and after he had swallowed without difficulty soup and milk, the patient died suddenly, without vomiting once. A thorough post-mortem, described with great care and minuteness, developed the following unexpected state of affairs. No traces of burning were apparent on either the bucco-pharyngeal cavity or the œsophagus, save, perhaps, a slight red tinge on a portion of the latter. The stomach was more affected, being much inflamed and indurated, but it was not perforated, and certainly the immediate cause of death was to be looked for elsewhere. As the duodenum and intestines were unaltered, it was evident the acid had not penetrated farther than the stomach. But the lungs were deeply injured. They showed, besides the traces of an old chronic broncho-pneumonia, violent inflammation of recent origin, which was the real cause of death. To explain such an effect it is to be supposed the acid found its way there in more than one manner,—first, when the poison was swallowed, the fumes, with possibly a few drops, got into the lungs; and secondly and chiefly, the efforts while vomiting, when under treatment, caused more of the caustic liquid to penetrate through the air-passages. Several experiments performed since then on animals have demonstrated the correctness of the theory, but they have shown also that when the acid touches only the stomach the animal will survive several days, with a tendency to probable recovery, while sudden death during the experiments can readily be traced to inflammation of the lung. The conclusions reached by Drs. Letulle and Vaquez are, that (1) in cases of poisoning with caustic liquids like muriatic acid less is to be feared from their action on the stomach than from the introduction of small quantities into the lungs; and, therefore (2), in accidents of the sort,

emetics should be avoided, and rapid stomach washing with appropriate solutions substituted. To which pepsin theorists would, perhaps, add a third conclusion,—namely, that all this proves muriatic acid to be the free acid of gastric juice, otherwise the stomach would not stand it so well.

While on the subject of poisonings, a strange case recently occurred here, which created no little sensation, and hitherto remained a mystery in some of its features. It is only accidentally that the truth has been discovered, and the THERAPEUTIC GAZETTE will be the first to publish it, as French papers will for the present keep mum on the affair. Last fall, a young scion of nobility, but only a non-commissioned officer in the army, the Baron de Carayon-Latour, was taken sick while at the Chalons camp, and sent to the Mourmelon Military Hospital for treatment. To hasten his cure, he prevailed upon one of the nurses to get him from the pharmacy some subnitrate of bismuth. This being against the rules, the man simply gave him a white powder, folded in a wafer; but, soon after taking the dose, young De Carayon-Latour was taken with symptoms of violent poisoning, which he concealed to save his comrade from punishment. At last, his state being evidently desperate, he obtained permission to be transferred to his family residence in Paris, where he died the next day. Of course an inquest was held to find out the cause of the accident, but nothing satisfactory transpired. The autopsy showed clearly enough the young officer's death to have been caused by some mercurial compound, but it remained impossible to explain how the poison could have got within reach of the good-natured but ignorant *infirmier* (nurse). The poisons were proved to have been, according to rule, kept in the poison closet, and the key thereof never to have left the possession of the military pharmacist in charge. It is only the other day that the truth came out, and it carries with it more than one lesson. It seems a sergeant attached to the hospital pharmacy, being chemically inclined, had been trying to make Pharaoh's serpents' eggs, and rubbed in a mortar some sulphocyanide of mercury, obtained outside, which the nurse mistook for bismuth subnitrate,—they are much alike,—and gave to deceased. As soon as trouble arose, the sergeant threw away the sulphocyanide, and kept his own counsel, much to the embarrassment of the authorities. Yet he finally spoke out, and was court-martialled this week. The judgment was one of acquittal, on the ground that sulphocyanide of mercury is not a recognized poison. The fact is, only one case, and that not fatal, is recorded against the chemical. Lime-water and iron by hydrogen were the antidotes. One important lesson to be drawn from the foregoing is, that *sulphocyanide of mercury is a poison* liable to cause death when no antidote is administered. The others are the more commonplace maxims that ignorant people should not meddle with chemicals, and, finally, that a patient should hide nothing from his physician.

A rather novel case of *tape-worm cure* occurred recently in Spanish Navarre, near the French frontier, a place where people are reputed to be rather handy with the knife. A man, during an argument, received a stab in the left meso gastric region, and through the cut a part of the intestine, opened by the same stab, protruded. The surgeon, on dressing the wound, noticed a paste-like substance issuing, and, on closer inspection, identified it as a part of a tape-worm. Since he had it thrust on him, the physician carefully pulled out the parasite, which proved to be entire and to measure five metres (sixteen feet) in length. The patient being robust and healthy, the wound healed up in six days, and he was thus cured of tape-worm without medicine. It is scarcely likely, however, the treatment will ever become a popular one for the cure of tape-worm.

Phloridzin has long retained a place in materia medica without being employed much at any time; but, like all things kept long enough in a house, it has found a use. Dr. Quinquand has been making experiments with it to determine the action of glucosides in general, and phloridzin in particular, on the economy, and succeeded in producing with phloridzin temporary glucosuria. When the chemical in question is injected into the veins or into the stomach, or even simply swallowed, in quantities ranging from one per thousand to one-fourth of one per thousand of animal weight, the urine is, after fifteen minutes, found to contain notable quantities of glucose. Many experiments instituted with glucosides have led Dr. Quinquand to divide these principles into two categories,—first, those which cause the formation of less glucose than the theoretical quantity contained in the glucoside administered; and, second, those which, like phloridzin, give rise to a passing glucosuria, and occasion much more sugar to be voided through the

urines than has been introduced in the shape of glucoside combination. Another interesting feature is that when phloridzin is administered the resulting glucosuria is accompanied with no increase of glucose in the blood. It may be useful to add also that with the doses above mentioned the animals are occasionally troubled with vomitings, but promptly recover.

After thus reviewing the progress of therapeutics, a branch of medical science, it may be piquant to relate on the science itself the views of a confirmed sceptic. Dr. Peter, a member of the Academy of Medicine, a professor at the faculty, and a bitter opponent of Pasteur's theories, the other day exposed his convictions, or the lack of them, as follows: "During my long career I have witnessed the birth and death of many medical theories. I saw the last days of Broussais's phlegmacy doctrine, next the heyday of the numerical theory, then Virchow's embolies, and, later on, all affections attributed to reflex action. So I have become something of a philosopher. In our days we have seen the birth of microbian theories already lapsing into an alkaloidal action, and thus taking us back from solidism to ancient humorism. But, all taken together, some progress is made. Of Broussais we have kept the knowledge of irritation; from the numerical method we have learned greater precision; from Virchow, embolies; from Claude Bernard, the reflex actions; and from the microbian doctrines, the necessity of hygiene. Thanks to the last theories, many have learned it is decidedly very beneficial to keep clean, drink pure water, and eat healthy food." Rather scant praise for Pasteur. But, no matter what pessimists may say, the world does move, and medical science keeps marching onward.

PARIS, January 18, 1889.

ISO-NITROSO-ANTIPYRIN.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—A combination of antipyretics, such as antipyrin and spirits of nitrous ether, which at the same time stimulates both the kidneys and skin to excrete, is very prone to suggest itself to those to whom the reduction of temperature is much of a consideration. But the reactions of such a mixture appeal so very strongly through our senses to our prejudices that it is not strange that we should have been voluminously warned against it. In all these warnings there has been (so far as I know) no relating of experience nor statement of reasons, but rather *ipse dixit* utterances.

Clinically, I have used a mixture of antipyrin fifteen grains, spirits of nitrous ether thirty minims, in several cases of common continued fever during the past year. That these cases would have terminated favorably without it I believe, but that the compound failed to control the symptoms for which it was administered, or exhibited any toxic or deleterious effect, I am prepared to deny.

After so much had been written, I instituted a few experiments to better determine the truth. The data I append.

No. 1.—Subject, a cat, rather thin; young; weight, two pounds. Temperature at beginning of experiment was 102°. Gave hypodermically eight minims of an eight-months'-old solution of fifteen grains of antipyrin in thirty minims each of spirits of nitrous ether and distilled water. In three hours this was repeated. Temperature fell to 100°; no constitutional disturbance.

No. 2.—Same animal; one day later; temperature, 102°. Gave an hypodermic injection of a recently-prepared mixture of three grains of antipyrin, four minims of spirits of nitrous ether, and six minims of water. Temperature fell to 99½°; no constitutional disturbance.

Very respectfully yours,
G. EVANS, M.D.

ABERDEEN, MISS., December 31, 1888.

THE IODIDES IN SYPHILIS.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—An experience of ten years in hospital practice, comprising service in the University and Philadelphia (Blockley) Hospitals, service in the United States Marine Hospital Corps, and attending surgeon to the Sisters of Charity Hospital in this city the past seven years (rich in genito-urinary diseases), has given me a moderately large experience in the use of iodide of potassium, and in the treatment of syphilis in all its stages. The discussion between Drs. Wood and White, therefore, is of particular interest to me. Memoranda of my reply to the questions asked editorially were made *before* reading the articles in question.

Yours truly,
W. H. HEATH.

BUFFALO, N. Y., 415 Pearl St.

QUERY I.—My experience with the use of iodides in syphilis has been comparatively large. I see and have seen more primary and secondary than tertiary, and but little implication of the nervous system.

QUERY II.—I believe the susceptibility to the iodide of potassium is more pronounced during the secondary stage, and that it diminishes in direct ratio as the tertiary is approached.

I base this opinion on my observation that mild iodism is more apt to occur (and often does) when treatment is changed from a tonic mercury to mixed treatment during the secondary stage than when it, or iodide alone, is instituted during the tertiary.

QUERY III.—My experience confirms the generally held view that patients with tertiary syphilis bear larger doses of iodide of potassium, and bear it well, than healthy individuals or those suffering from other chronic maladies.

There is no better opportunity for comparing the tolerance of the drug in syphilis and other chronic maladies than in the Marine Hospital Service, where instances are constantly afforded of inability to push iodide of potassium in one disease, for instance, chronic rheumatism, while in the same ward, perchance the next bed, a case of late syphilis will be taking enormous doses and thriving upon it.

I have, however, seen cases of rupia and late syphilis unable to take iodide of potassium, save in very small doses, and the remedy have no effect. These cases were improved and finally cured by iron, cod oil, bichloride, and change of climate.

(I do not believe, for this and other reasons, that iodism is evidence of the non-existence of the specific taint.)

Notes and Queries.

HEREDITARY SYPHILIS.

According to the Vienna correspondent of the *British Medical Journal* for January 12, 1889, at a recent meeting of the Imperial Royal Society of Physicians of Vienna, PROFESSOR NEUMANN read a paper on "Hereditary Syphilis." The questions with which the lecturer dealt were the following: 1. What is the condition of the offspring when the father and mother were healthy at the time of conception, and the mother became infected at a later date (pure post-conceptional syphilis)? 2. What is the effect of post-conceptional syphilis with reference to the offspring when the father was already syphilitic at the time of procreation? 3. What is the effect of post-conceptional syphilis with reference to the offspring when the condition of the father's health at the time of procreation was unknown, and the mother was healthy at the time of conception, and became infected at a later date? 4. What is the condition of the offspring when the infection and the conception took place at the same time? And, 5, when the infection of the parents occurred before conception? Professor Neumann's paper was based on cases most of which he had observed during eight years in his clinic. Of these, only one hundred and two were available for the purpose he had in view, as accurate data concerning the offspring could not be obtained in the rest. The physicians of the three obstetric clinics of the General Hospital and those of the Vienna Foundling Hospital also took an active part in the investigation. With regard to pure post-conceptional syphilis, Professor Neumann had observed eleven cases; of these, five were healthy, and the rest, in part, presented the appearances of syphilis, and, in part, miscarriage occurred. As regards post-conceptional syphilis, where the father was syphilitic, five children were found to be healthy, two children were affected with syphilis, and in five cases miscarriage had occurred. In the cases of post-conceptional syphilis, where the father was unknown, there were ten healthy, one syphilitic, and seven dead children; two children were still under treatment. In the cases in which conception and infection took place at the same time, fifteen children were healthy, one died of peritonitis, four were syphilitic; the fate of these cases could not be ascertained, and in twenty-one instances still-birth occurred. Among twenty-five cases of syphilitic infection before conception, there were ten healthy children, eight cases of miscarriage, and four of maceration; three were still under treatment. Professor Neumann arrived at the following conclusions: 1. A syphilitic mother may convey the disease to her offspring at any stage of her affection, whether the infection had taken place before or after the conception. 2. A mother who had contracted the disease after conception sometimes transmitted it to the fœtus. In the case of pure post-conceptional syphilis the transmission of the affection to the child was extremely rare,

and particularly when the mother had become infected in the last months of pregnancy. 3. When the infection of the mother had taken place after conception, and the father was syphilitic at the time of procreation, the effect on the offspring was greatly intensified; the children in these cases died *in utero*, or were born with signs of syphilis. 4. In the case of post-conceptional syphilis, where the infector was unknown, the proportion was the same as in pure post-conceptional syphilis; syphilis acquired in the last months of pregnancy was usually transmitted to the offspring. 5. When infection and conception occurred at the same time, the children died in one-half of the cases. It was, nevertheless, remarkable that a great part of the offspring remained free of syphilis, in spite of the fact that the disease was in an active state in both the parents at the time of conception. This disproved the assertion that a healthy child could never be born when both parents were syphilitic at the time of conception. On the other hand, the assertion that healthy children were born only when the syphilis of the parents was seven years old was also negatived. 6. In the case of infection before conception, the period at which conception occurred had to be taken into account; the longer the interval between infection and conception, the more favorable was the prognosis for the offspring. 7. The offspring had the best chance when the mother only contracted syphilis in the last months of pregnancy, while the father was healthy at the time of procreation; the same was also true of the offspring of parents suffering from tertiary syphilis. The offspring had the least chance when infection and conception had occurred simultaneously, or when the father was suffering from recent syphilis at the time of procreation. 8. This last observation also elucidated the question as to paternal syphilis. It was especially these cases in which the father was syphilitic at the time of procreation, and the mother became infected only after conception, and the child was soon after the infection born in a macerated condition, which proved the extremely injurious nature of paternal syphilis. This was opposed to the observations of Boeck and Dewere, who stated that the child of a syphilitic father was always healthy. These data, concluded Professor Neumann, showed the sad fate of the children of syphilitic parents, as, out of one hundred and nine cases, only forty-four were born healthy, and, according to inquiries made by Dr. Friedinger, director of the Vienna Foundling Hospital, only the minority of them lived. Hereditary syphilis must, therefore, be considered one of the most terrible plagues of infant life.

LOCAL ANÆSTHETIC ACTION OF ANTIPYRIN.

Hypodermic injection of antipyrin has been strongly recommended for the relief of pain by Sée and others. Sée considers that it rivals morphine in the extent of its action, that it has not the unpleasant after-effects of that drug, and that it does not interfere with nutrition nor lead to a "craving." BERDACH has lately been experimenting with the drug in this way at Professor Bamberger's clinic at Vienna. He uses a fifty per cent. solution, in distilled water, and has experienced nothing but favorable results. All kinds of painful conditions were so treated, the injection being made at the most painful spot. For a few seconds after administration there is local pain and burning, but this soon passes off, and is followed by analgesia over an area of more than a centimetre round the point of injection. Fränkel and others had previously noticed this. The most important point in Berdach's observations is that the pain is relieved in a few seconds after the injection, the relief lasting for at least six hours. No disagreeable effects, such as vomiting, sweating, rash on the skin, or depression of the heart or pulse, were noticed, and in those patients that were febrile the temperature remained uninfluenced.—*Druggists' Circular*, January, 1889.

THE KIDNEYS IN DIABETES.

R. FICHTNER (*Virch. Arch.*, cxiv., Hft. 3) points out that among the lesions observed in the kidneys of subjects of diabetes, glycogenic degeneration or infiltration of the epithelia of Henle's tubes is one of the most constant, but yet difficult of explanation. Changes in the cortex have been less frequently met with; some have seen acute interstitial inflammation, leading even to granular kidney; others describe epithelial necrosis, especially in cases of diabetic coma, attributable to the action of acetone and diacetic acid. Fatty degeneration is described by various writers, notably V. Frerichs and Ebstein, the latter meeting with marked fatty change and free fat between cells. Fichtner, in two cases of diabetic coma, found, in addition to the

glycogenic degeneration of Henle's tubes, very marked fatty degeneration of the cortical epithelium, the fat globules and particles being in each case regularly arranged along the periphery of the cells just beneath the basement membrane; and those tubules solely were affected which contained cloudy epithelium. The epithelia of other parts, as well as the glomeruli and the connective tissue, were apparently normal; and there was no indication of necrotic or inflammatory change. The absence of inflammation was remarkable, especially in one of the cases, which during life presented albuminuria and renal casts, and was, therefore, considered to be a case of chronic nephritis, with diabetes. The peculiar type of fatty change had been met with by Fichtner in a case of chronic nephritis following alcoholism, but in that case many tubules exhibited a more diffuse degeneration than the variety described. In cases of phosphorus-poisoning the cells are filled with fat globules of various size and grouping. In seeking for an explanation of the lesion, he remarks that both these patients died comatose, and had the peculiar odor of the breath indicative of acetone and diacetic acid in the urine. Having regard to the previous observations of Albertoni and Pisenti, as well as of Ebstein, which point to the connection between epithelial necrosis in the kidney and the presence of these substances in the urine, it is highly probable that the special kind of fatty degeneration must be referred to these or allied bodies. If fatty degeneration occurs apart from coma, its cause must be found in the excess of sugar. The subject is open to experimental research, which may throw some light upon the subject of renal secretion.—*Lancet*, January 5, 1889.

COMPRESSION OF THE BRAIN AND SPINAL CORD.

Formerly it was assumed that as an axiom that brain-tissue was practically incompressible, and the symptoms caused by increase of the intracranial pressure were supposed to be due to cerebral anæmia. Experiments on animals, however, prove that these suppositions are wrong. For the volume of the brain can be diminished by pressure, and this diminution is not due to narrowing of the blood-vessels, but to the displacement of fluid from the cerebral tissue into the subarachnoid space, and thence into the cord and the lymphatics and veins of the neck. When the pressure is below a certain limit, but yet sufficient to materially lessen the bulk of the brain, the cerebral blood-vessels actually dilate. The dilated vessels supply sufficient nutriment to the compressed tissue, and there are no functional disorders of the parts of the brain involved. When the pressure is below the limit at which functional disorders appear, our author considers the compression to be of the first degree. In compression of the third degree there are visible breaches of continuity; in other words, the brain is crushed or bruised. Between compression which causes no functional disorders, and compression which produces structural lesions, lies compression of the second degree, in which the damage done to the tissues is said to be molecular or dynamical, because it cannot be detected by the microscope. While compression of the second degree lasts, there are pronounced functional disorders, but complete functional restitution follows on the removal of the compressing force. ADAMKIEWICZ (*Wiener Medizinische Wochenschrift*, Nos. 41, 42, 43, October, 1888) found in animals that when the compression just attained to the second degree, irregular attacks of clonic spasms of the opposite side of the face and opposite limbs (contralateral hemiclonus) appeared. As the pressure was increased, hemispasm was replaced by hemiplegia, muscular contraction, and exaggerated tendon reflexes. Paraplegia followed hemiplegia, and spastic tremors and paralytic trembling were observed as the compression approached and passed into the third degree. In man, as is well known, cerebral tumors may remain latent, or give rise to hemispasm, hemiplegia, paraplegia, and spastic phenomena. In our author's terminology, cerebral tumors cause compression of the first or second degree. Adamkiewicz has cited elsewhere cases to illustrate the disappearance of hemispasm and hemiplegia when the tumor or other cause of increased intracranial pressure was removed. In the following extraordinary case he was enabled to observe the immediate effects of compression on the human brain. A young countryman had a large soft sarcoma removed from the top of the head. The tumor had eaten through the bone, and by the operation the dura mater was exposed over an area of twelve to eight centimetres. The hole in the skull was filled with a firm tampon, and on this a board was placed to support weights. The greater part of the tampon was forced within the cranium, but no symptoms were produced by placing a

weight of seven kilogrammes on the board. Hence in man, as in animals, when the brain is compressed to a certain degree, its volume is diminished, but no functional reaction ensues. Other observations of the author confirm this result. To return to the case under consideration: A few weeks after the first operation, a second was undertaken, to remove the tissues infiltrated by the growth. The longitudinal sinus was opened, and great pressure had to be applied to stop the hemorrhage. As long as the patient remained fully under the anæsthetic all that was noticed was that the breathing was stertorous and irregular. But half an hour after the application of the compress paroxysmal attacks of screaming set in. A hemispasm accompanied each screaming fit. The hemispasm was confined to the left arm and leg, and consisted of rapid flexions. The closed fist was drawn towards the forearm and the forearm hurled towards the upper arm. In the lower limb the movements were confined to the hip and knee-joints. Each fit lasted two or three seconds, and the interval between two consecutive fits was four to five minutes. The patient died about an hour after the operation. At the autopsy it was found that the superior parietal lobules had been injured by the surgeon's knife, and that the upper third of the ascending frontal convolution and posterior part of the first frontal on the right side were so flattened that the furrows were completely obliterated. The corresponding region on the left side was flattened, but not to the same degree or extent. Adamkiewicz argues that the flattening was due to the pressure of the compress, and that the hemispasm was caused by the compression of the upper right motor region in front of the fissure of Rolando. He concludes that there are three degrees of compression of the human brain, characterized by the same phenomena which he observed in his experiments on animals.

Compression of the spinal cord has been supposed to cause myelitis by producing anæmia, and consequently disorders of nutrition and necrosis. But Adamkiewicz finds that this fundamental premise of the doctrine of the so-called compression myelitis is false. He shows that in man tumors may alter the shape and lessen the volume of portions of the cord without causing any functional disturbance, and therefore without materially interfering with the nutrition of the compressed tissue. In rabbits he introduced slips of laminaria between the dura mater and wall of the spinal canal, and thereby not only altered the outline and diminished the volume of the adjacent parts of the cord, but greatly deflected the paths of the nerve-fibres. In spite of this, the normal functions of the cord were performed for months. Hence compression of the cord, which stops short of bruising, causes neither anæmia nor inflammation. Myelitis associated with compression is not due to pressure, but to the simultaneous presence of irritants, such as the products of caries of the vertebræ. A case of spinal curvature is related as an example of compression of the second degree. The lower cervical and upper dorsal regions were involved in the curvature, and the symptoms were paraplegia and slight vasomotor disorders. As there were no indications of caries, no affections of the sensory nerves, no changes in the reflexes or electrical reactions, nor the slightest bladder or rectal trouble, it was supposed that there was neither myelitis nor any break in the continuity of the tissue. When the patient was suspended from the axillæ an immediate improvement in the movements of the legs took place, and the paraplegia became directly as bad as ever when the suspension was interrupted and the weight of the body no longer tended to straighten the curved column.—*Medical Chronicle*, January, 1889.

ALBUMINURIA OF PREGNANCY AND PUERPERAL ECLAMPSIA.

Dr. Lantos, of Buda-Pesth, has recently made a series of observations on albuminuria of pregnancy in the wards of Professor von Kézmársky. In over eighteen per cent. of seventy pregnant women he found albumen in the urine, while in nearly sixty per cent. of six hundred newly-delivered women the urine was albuminous. Albuminuria was detected in over seventy per cent. of two hundred and sixty-eight primiparæ, and over fifty per cent. of three hundred and thirty-two multiparæ. The percentage was distinctly lower in premature labor, and fifty per cent. lower in abortion cases. Out of ten cases where albumen was abundant, so that Dr. Lantos used the microscope, he found pus in three and casts in five, but no foreign elements in the remainder. He examined the kidney in thirty-nine cases where the patients had neither died from eclampsia nor from nephritis. In fifteen of these cases the kidneys were very anæmic, in twenty-one pale, and only in three full of blood. Among the local changes in other

cases he found acute parenchymatous nephritis in two cases, acute hemorrhagic nephritis in one case, parenchymatous degeneration in nine cases, and in four albuminous degeneration.

Dr. Lantos, therefore, concludes that, putting aside all evident and probable cases of nephritis in pregnant women, albuminuria is not rare in pregnancy, and very common after parturition. He refers the phenomenon to reflex irritation of the vaso-motor nerves of the renal vessels; it has no pathological significance, and, in conjunction with other symptoms, is a valuable diagnostic sign of pregnancy. Out of fourteen thousand eight hundred and fifteen labors observed in the course of fifteen years, he noted fifty-three cases (.36 per cent.) of puerperal eclampsia, a ratio of two hundred and seventy-eight to one. Over seventy-eight per cent. out of forty-two eclamptic cases occurred in primiparæ, over twenty-one per cent. in multiparæ; fifteen out of the entire fifty-three died.

Dr. Lantos thinks that the rate of mortality is increased when instruments are used, and as the convulsions often do not cease after delivery, he thinks that the forceps should not be used unless there be strong indications. Convalescence is much prolonged after eclampsia. In twenty-three of the eclampsia cases the urine was examined; in twenty-one it was albuminous, casts being found in four. At the necropsies of fatal cases of convulsion, Dr. Lantos found constant changes in the brain, but only once acute, though frequently chronic, renal changes. Like Osthoff, he traces puerperal eclampsia to violent reflex vaso-motor disturbance, and classes it as acute peripheral epilepsy. The original monograph, well worth the attention of obstetricians, is to be found in the *Archiv für Gynäkologie*, vol. xxxii. part 3.—*British Medical Journal*, January 12, 1889.

A CASE OF POISONING WITH CANTHARIDES.

Dr. Garcia Camba states in the *El Siglo Medico* (*Lyon Médical*, December 30, 1888) that last June he was called to see a woman who complained of severe pain in the bladder and urethra, and great difficulty in the emission of urine. During his visit the husband and the daughter, aged 8 or 9 years, were affected with the same symptoms. On interrogation, it was found that these individuals had recently roasted and eaten a half-dozen young birds which they had found in a nest. By accident they had preserved the intestines and gizzard, and, on opening these organs, Dr. Camba found them filled with small brilliant particles, among which he recognized the fragments of the elytra of *Cysta vesicatoria*. An emulsion of camphor and friction with belladonna ointment led to the cure of the three patients.

THE ABSOLUTE SIGNS OF DEATH.

At the meeting of the Medical Society of London, held December 10, 1888, Dr. B. W. Richardson read a paper on this subject (*British Medical Journal*, December 15, 1888). He opened by saying that in the present day, owing to the discussions that were taking place on the subject of cremation and the disposal of the dead, members of the profession were more frequently being called in in consultation in order to determine if life were actually extinct. He proposed, therefore, in the short essay he was about to read, to state in a very practical form, first, the common circumstances under which the inquiry was demanded; secondly, the methods for determining the absolute proof of death; thirdly, a summary of efficient practical details. Under the first of these heads the author specifies the reasons which led the friends of persons supposed to be dead to question the fact of death. These were: (*a*) changes of color of the dead body; (*b*) retention of warmth; (*c*) movements of parts, or supposed movements; (*d*) retention of life-like expression after death; (*e*) prolonged preservation of the body from putrefactive decomposition; (*f*) suspension of the ordinary phenomena of vital action after some forms of induced narcotism; (*g*) the cataleptic state, traumatic and idiopathic. One other circumstance might also give rise to the inquiry,—namely, a request on the part of the person while living to be subjected to skilled examination after death, in order to prevent the possibility of living burial. The author twice in his career had been called in to meet this demand or request. The various circumstances which might lead to a doubt as to absolute death, some of them very important and singular, were next described in detail; and then followed the second part,—namely, the actual or veritable proofs that had to be made in order to arrive at a satisfactory demonstration that life was extinct. These proofs were named as ten in number.

They were taken up in the following order: (1) respiratory failure, including absence of visible movements of the chest, absence of respiratory murmur, and absence of water vapor from the breath; (2) cardiac failure, including absence of arterial pulsation, of cardiac motion, and of cardiac sounds, absence of turgescence or filling of the veins on making pressure between them and the heart; (3) reduction of the temperature of the body below the natural standard; (4) rigor mortis and muscular collapse; (5) coagulation of blood in the veins; (6) putrefactive decomposition; (7) absence of red color in semi-transparent parts under the influence of a powerful light; (8) absence of muscular contraction under the stimulus of an electric or galvanic current; (9) absence of a red blotch on the skin after the subcutaneous injection of ammonia; (10) absence of signs of rust (oxidation) of a bright steel needle after plunging it deeply into the tissues. In the last part of his paper Dr. Richardson indicated the precise mode in which the practice named above should be directly applied, taking up the steps of the necessary examinations one by one, pointing out the relative values of each, and giving, so to speak, in a condensed form, the diagnostic formula for an absolute proof of death in every doubtful case, without any operative procedure that was itself inimical to life.

The PRESIDENT complimented Dr. Richardson on his interesting and elaborate paper. He thought the method of compressing the veins at the back of the wrist was a very simple and efficient method. He remarked on the fact that execution by electricity had been decided upon in the United States, a fact which, in view of Dr. Richardson's conclusions, might have untoward results.

DR. ROUTH mentioned that persons who died of pneumonia retained the coloration of the cheeks; and recalled an incident at Clamart which had forcibly impressed the fact upon his memory. Passing on to the question of temperature, he mentioned a case of ovariotomy in which the temperature rose two degrees after death, and even the next morning, though it was in the winter, the temperature was still two degrees above normal. He also referred to the post-mortem movements in patients who had succumbed to Asiatic cholera.

DR. ALTHAUS alluded to the universal dread felt towards being buried alive. He observed that the occurrence of a post-mortem rise of temperature was a recognized fact, notably in tetanus. In other cases, again, there might be a remarkable fall in temperature before life was extinct, so that temperature *per se* could not be relied upon to prove anything. He had known the temperature to go down to 93° within twenty minutes after an apoplectic attack, and the same phenomenon was often observed in wasting diseases and as a consequence of inanition. He mentioned one such recorded case, in which the temperature fell as low as 81° F., though the patient was undoubtedly alive. In his opinion, the only really reliable test, except putrefaction, was the reaction of muscles to electricity. In no disease, short of death, was the contractility of muscles absolutely destroyed all over the body at the same time. He said that very soon after the heart ceased to beat a steady and perceptible diminution in the extent to which the muscles responded to the electrical current was noticed, and all trace of reaction disappeared in about two hours, certainly within three hours. It persisted longest in powerful men the victims of violent death. He mentioned a case in which this test had proved conclusively that the patient was dead.

The PRESIDENT asked Dr. Richardson how he accounted for the facts observed by himself and others on the battle-field of the occurrence of instantaneous rigor mortis in soldiers. He had seen them preserve the attitude in which they were at the moment of death, the arms raised as in drinking, or holding the musket, etc.

DR. RICHARDSON, in reply, observed that he had protested against the introduction of death by electricity as being altogether unreliable. He quoted a series of experiments made on sheep, and showed that while it was possible, by means of a very powerful current, to kill small animals, birds, etc., it was quite otherwise when large animals were experimented with. He said that he had asserted that the color in the cheeks persisted in death by asphyxia, to which category death from pneumonia belonged. He alluded to the fact that no one could, by will, impose on the survivors any particular method of disposing of the body by cremation or otherwise. He thought the discretion rested with the executor (Dr. Routh claimed that wife or next of kin was the authority in such matters), and suggested that the legal right to leave directions in this respect might fairly be applied for. He denied that rigor mortis ever produced any change in position, all the muscles undergoing the change simultaneously. In

reply to the President, he said that the sudden rigor in the cases mentioned was probably due to the immediate coagulation of the albuminous constituent of the body, due to the heat developed by the sudden resistance offered to the circulation.

DRUG ADULTERATION.

The Committee on Drug Adulterations appointed annually by the State Pharmaceutical Association, and consisting this year of H. M. Whelpley, St. Louis; J. A. Gallagher, Kansas City; D. L. Haigh, St. Louis; R. T. Thornton, Rich Hill; R. S. Hughes, Odessa; earnestly request the assistance of the members in their important work.

A cordial invitation is also extended to pharmacists not members of the association and to the physicians of the State to assist in the work. At the last meeting of the State Association, the Committee on Drug Adulterations was instructed to extend this committee to any extent deemed proper, and to interest the pharmacists and physicians of the State in the importance of its work and the direct good accruing from it.

It is the intention of the committee, therefore, to try and ascertain as far as possible how near the official substances dispensed in this State conform to the requirements of the United States Pharmacopœia. If each druggist in the State would select one official substance, and procure a sample in his vicinity, and apply to it the pharmacopœial tests, the sum total of results thus obtained would be of incalculable value. The tests of the United States Pharmacopœia are very simple and especially adapted for use in retail stores.

It is not desirable that the report of this committee shall be composed of intricate chemical analysis of substances of no special interest to druggists, but it is earnestly desired that it be a report that represents practical value to each druggist and physician in the State.

Reports of work done for the committee will be tabulated, and read before the association at the next annual meeting at Pertle Springs, June 18, 1889, and full credit will be given to persons having performed the work.

Those who have articles suspected of adulteration can send them to the committee, if they themselves have not the time to examine them.

Address the chairman,

H. M. WHELPLEY,
No. 113 Market Street,
St. Louis, Mo.

GLYCERIN SUPPOSITORIES.

BOAS recommends glycerin suppositories instead of small enemata of glycerin. They may be made by dissolving 10 parts of dialyzed stearine soap in hot water, mixing the solution in 90 parts of pure glycerin, filtering in a steam filter, evaporating down to 100 parts, and pouring into moulds. They may also be made with cacao-butter.—*Medical Chronicle*, January, 1889.

THE TREATMENT OF BURNS BY COCAINE AND LANOLIN.

DR. WENDE recommends in the *Journal de Médecine de Paris* the use of an ointment of hydrochlorate of cocaine and lanolin as a dressing for burns. By this mixture not only is perfect occlusion obtained, but pain is almost immediately arrested. It is necessary, however, that the cocaine be pure, and that the ointment be recently made.

THE TREATMENT OF NIGHT-SWEATS BY THE EXTERNAL USE OF CHLORAL.

According to the *Gazette Médicale*, DR. NICOLAÏ has obtained good results in the night-sweats of the phthisical by the employment of an embrocation of hydrate of chloral, two drachms dissolved in a tumblerful of brandy and water. Every night about bedtime the patient is rubbed all over with a sponge dipped in this solution. Sometimes three or four rubbings suffice to effect the complete disappearance of night-sweats, which have previously lasted for weeks.—*Boston Medical and Surgical Journal*, January 10, 1889.

EFFECT OF ANTIPYRIN IN THE SECRETION OF MILK.

In the *Medical News* of December 8, DR. T. HAVEN ROSS calls attention to the value of antipyrin as a means of suppressing the flow of milk. He relates a case in which the daily dose of 24 grains was very effectual.

AN IMPORTANT CORRECTION.

In the notes by Dr. H. C. Wood on "Nasal Bougies," published in our January number, it was stated that each bougie should contain one grain of cocaine and one-twentieth grain of atropine sulphate. It should have been stated, one grain of cocaine and one one-hundred-and-twentieth grain of atropine.